Marriage, Health, and Life Satisfaction

The Ambiguous Link between Marriage and Health: A Dynamic Reanalysis of Loss and Gain Effects

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The positive link between marriage and health has frequently been analyzed and typically been interpreted in terms of health protection. Recently, the benefits of marriage have been criticized by sociologists who emphasize the strength of single persons in societies where being single is fully institutionalized. This paper reviews the evidence and addresses a number of unresolved issues in the literature, using recent annual panel data over a 16-year period from Switzerland. The findings cast doubts about the theory of health protection. The impact of "loss" (divorce) is about three times stronger than the impact of "gain" (marriage entry), and the effects of gain are often very small. Moreover, after marriage entry and after marriage exit, there is adjustment rather than accumulation. Especially after divorce, we find substantial recovery over the years. Finally, the results are highly sensitive to the outcome studied. Effects are strongest for life satisfaction, weak for mental health, and almost absent for two concrete health measures. We speculate that marriage is primarily linked to a more positive evaluation of one's life rather than to better health.

Introduction

A long-standing claim in the fields of family studies and medical sociology is the notion that marriage promotes adult health (Carr and Springer 2010; Simon 2014; Umberson and Montez 2010; Waite and Gallagher 2000). People who are married are believed to have fewer physical health problems, they have better overall health, they tend to live longer, they experience lower levels of psychological distress, and they are depressed less often. Several explanations have been suggested for the protective effects of marriage and other personal relationships more generally (Berkman et al. 2000; Carr and Springer 2010; Waite and Gallagher 2000). The first explanation focuses on economic resources. Due to economies of scale and positive effects of marriage on men's wages, marriage brings financial advantages that can lead to healthier living conditions and higher-quality healthcare (Killewald 2013; Waite and Gallagher 2000). A second argument focuses on the social control function of marriage. There are norms

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against behaviors that pose a health risk (e.g., smoking, drug use), and it is believed that when people marry, they are more likely to adhere to such norms (Duncan, Wilkerson, and England 2006; Fleming, White, and Catalano 2010; Monden et al. 2003; Umberson 1992). This is in part because a spouse can sanction norms and in part because married people have a sense of responsibility for their family that makes them more likely to adhere to norms prohibiting unhealthy behaviors. Third, the marital relationship is a source of social support and affection that may reduce loneliness and depressive feelings and, hence, lead to better mental health. There has been debate as to whether the link between marriage and health is due to selection or protection, but sophisticated longitudinal analyses suggest that the protection effect is stronger than the selection effect (Johnson and Wu 2002; Kim and McKenry 2002; Waldron, Hughes, and Brooks 1996).

The number of studies on the link between marriage and health is large and still growing, in part as a result of better longitudinal datasets that have become available and the development of more advanced longitudinal models (Anusic, Yap, and Lucas 2014; Johnson and Wu 2002; Musick and Bumpass 2012; Wade and Pevalin 2004). Much contemporary research has shifted its attention to sources of heterogeneity in the effects of marriage (Hawkins and Booth 2005; Kalmijn and Monden 2006; Williams and Dunne-Bryant 2006; Williams, Sassler, and Nicholson 2008). While this is an important new line of research, there are still questions about the strength and meaning of the main effects. The health benefits have been criticized by sociologists who argue that singletons are relying on alternative relationships and ways of belonging that benefit their health (Jamieson and Simpson 2013; Klinenberg 2012). Some psychologists have been critical as well, and have argued that researchers have overstated the evidence and interpreted findings too quickly in terms of health protection (DePaulo and Morris 2005). These critical studies have primarily examined the position of single persons, but by shifting the focus from married to single persons, they have discovered several compensation mechanisms—alternative networks and relationships, personality differences, adjustment effects—that cast doubts about the health benefits of marriage.

In this paper, we address a number of unresolved issues and criticisms in the literature. Using annually collected national panel data over a 16-year period in a European country (Switzerland), we statistically compare the effects of marriage entry and marriage exit and we test duration effects during marriage and during singlehood after divorce.[1] The underlying goal of this analysis is to test the idea of marriage protection in a more stringent manner. If health protection is operating, we would expect effects for both entry and exit; effects on health should not be limited to "loss" but also be visible for "gain." Moreover, protection effects imply an accumulation of health benefits while being married as well as an accumulation of disadvantage after divorce, rather than adjustment after marital transitions. In addition, we examine effects on multiple outcomes: self-rated health, illness, depressive feelings, and life satisfaction. Although previous studies have also studied more than one outcome, we use standardization procedures to compare the presence and strength of the transition effects across

outcomes. In doing so, we address the suspicion that the benefits of marriage are merely related to happiness and not to improvements in health. Our focus is on persons aged 18–65, which means that we do not consider transitions during old age. Marital transitions during old age include widowhood, which brings in a host of other theoretical considerations. Moreover, marriage entry occurs less often during old age, which makes the entry-exit comparison more difficult.

Background

In table 1, we present an overview of studies linking marital transitions to mental and physical health outcomes. The overview is limited to studies since 2000 but includes some older influential studies. The overview is not complete but does cover studies in the major journals in the field in so far as we are aware. A quick view of table 1 shows that there are more studies on the effects of marriage exit than on marriage entry, more studies on mental health than on physical health, and more studies on the United States than on other countries.

Loss or Gain?

One important unresolved issue in the literature lies in the distinction between entering a marriage and leaving a marriage. As the overview table shows, most of the research has focused on divorce, and while that evidence seems convincing, the effect of divorce on health confounds two influences: the absence of a protective tie and the loss of an intimate relationship. There are good reasons to believe that "loss" is more consequential than the absence of "gain." First, for many people, divorce is an emotional crisis characterized by feelings of anger, sadness, and grief. Divorce can resemble the bereavement process, and in that sense can have important negative effects on health (Stroebe, Schut, and Stroebe 2007). Second, divorce is a life event that sets in motion a large number of changes that can all be stressful. These so-called secondary stressors can also affect one's health in a negative way (Pearlin 2009). If effects are primarily found for divorce and less or not at all for marriage entry, this would be evidence against the notion of protection. So far, few authors have systematically compared gain and loss effects in one analysis. The studies that have done so seem to find stronger effects of "loss" but did not test the difference (Simon 2002; Strohschein et al. 2005; Williams and Umberson 2004). In this study, we compare the effects of marriage entry and exit on health outcomes and develop a design to statistically test the difference between these effects.

Accumulation or Adjustment?

Another issue about which debate continues lies in the dynamics of the marriage effects (Hughes and Waite 2009; Johnson and Wu 2002; Williams and Umberson 2004). How health changes after the entry into or exit from marriage is an important issue because it tells us something about the theoretical mechanisms that are at work. According to the notion of marriage protection, we would

Table 1. Overview of Studies on the Effects of Marriage on Health

Study	Entry	Exit	Outcome	Design	Data/country
Barrett (2000, 2003)	+	+	Depression	C	Piedmont Health Survey (US)
Blekesaune and Barrett (2005)		+	Sickness benefits	L	Register data (Norway)
Booth and Amato (1991)		+	Psychological distress	L	Booth et al. panel (US)
Dahl et al. (2015)		+	Sickness absence	L	Register data (Norway)
Dupre and Meadows (2007)		+	Disease onset	L	HRS (US)
Frech and Williams (2007)	+		Depression	L	NSFH (US)
Hank and Wagner (2013)		+	Depression	L	SHARE (Europe)
Horwitz et al. (1996)	+		Depression	L	Rutgers Health and Human Development Project (US)
Hughes and Waite (2009)		+ + +	Depression Chronic conditions Self-rated health	C	HRS
Johnson and Wu (2002)		+	Psychological distress	L	Booth et al. panel (US)
Kalmijn and Monden (2006)		+	Depression	L	NSFH (US)
Kamp Dush (2013)		+	Depression	L	Fragile Families (US)
Kim and McKenry (2002)		+	Depression	L	NSFH (US)
Liu and Chen (2006)		+	Depression	L	NLSY (US)
Liu and Umberson (2008)		+	Self-rated health	C	NHIS (US)
Lorenz et al. (2006)		+ 0	Psychological distress Physical illness	L	Rural Iowa Panel (US)
Mastekaasa (1995)		+	Psychological distress	L	Norwegian Level of Living Survey (Norway)
Monden and Uunk (2013)		0	Self-rated health	L	European Community Household Panel (Europe)

Musick and Bumpass (2012)	+ 0		Depressive symptoms Self-rated health	L	NSFH (US)
Simon (2002)	+	+	Depression	L	NSFH (US)
Strohschein et al. (2005)	+	+	Psychological distress	L	National Population Health Survey (Canada)
Wade and Pevalin (2004)		+	Mental health index	L	BHPS (UK)
Hughes and Waite (2009)		+	Depression	L	NSFH (US)
Williams (2003)	+	+	Depression	L	Americans Changing Lives (US)
Williams and Umberson (2004)	+	+	Physical health	L	Americans Changing Lives (US)
Wu and Hart (2002)	0 0	+/0 +	Health Depression	L	National Population Health Survey (Canada)
Zhang and Hayward (2006)		+/0	Heart disease	L	HRS (US)

Note: Entry means marriage formation; exit means marital dissolution. Studies on mortality not included in this overview. Only studies were considered that present regression effects in longitudinal or cross-sectional multivariate models. + means that marriage is positive for health, − means negative for health, 0 means no effect. C = cross-sectional, L = longitudinal.

expect that health effects accumulate over time. The benefits of being in a union will probably not be immediate but will take some time to manifest themselves. As the marital tie becomes stronger, spouses start influencing each other and gradually become more strongly oriented toward family responsibilities. This would imply that the positive marriage effect becomes stronger with the duration of marriage (Waite and Gallagher 2000). A similar prediction can be made for divorce. The lack of a protective spouse means that health will deteriorate with the passage of time after divorce. Due to the lack of social control, some divorcees may develop less healthy behavior and engage more often in risky behavior, leading to a gradual deterioration of one's health (Hughes and Waite 2009).

An alternative view lies in the notion of adjustment. The stress surrounding a divorce is often temporary, and the negative emotions surrounding the loss of a relationship will also decline with time (Stroebe, Schut, and Stroebe 2007). This implies that the initial decline in health should be reversed at some point, in line with the so-called "crisis model" of divorce (Booth and Amato 1991; Pearlin 2009). A similar form of adjustment may occur for the entry into marriage. According to the setpoint theory of life events, a marriage may entail only a temporary increase in well-being. After a "honeymoon effect," people may return to their original level of well-being that is determined by stable personality characteristics (Anusic, Yap, and Lucas 2014; Musick and Bumpass 2012; Soons, Liefbroer, and Kalmijn 2009). In short, the theory of health protection suggests increases in health after marriage and decreases after divorce, whereas the notion of adjustment suggests the opposite duration effects. Some authors have studied the dynamics in health after marriage and found evidence for adjustment, but the time periods were often short (Blekesaune and Barrett 2005; Wade and Pevalin 2004; Williams and Umberson 2004). Moreover, some authors found no adjustment (Johnson and Wu 2002; Mastekaasa 1995) or even accumulation (Hughes and Waite 2009). In this paper, we examine duration effects empirically by examining how health changes within persons during marriage and during the time after divorce. Because we have year-to-year panel data over a 16-year period, we can obtain a detailed view of post-transition dynamics in health.

Health or Something Else?

There is also uncertainty about which aspects of health are affected by marriage. First, there is the important distinction between mental and physical health. As table 1 shows, most studies focus on mental health; the evidence for physical health is more scarce and less convincing. Theoretically, this distinction is important because it might tell us something about the theoretical mechanisms that are at play. The mechanisms of social control and social support have different implications for different health outcomes. In the social control mechanism, marriage leads to a reduction in unhealthy and risky behaviors, a better response to health problems, and more discipline and commitment in taking treatment (Umberson 1992). This mechanism would lead to better physical health and not—or only indirectly—to better mental health. If we find effects of marriage

only on mental health, however, the marriage effect may have more to do with the social support mechanism. Marriage provides people with company, a sense of belonging, and emotional support in times of crises, and these effects may reduce depressive feelings or prevent them from developing. In other words, the social support mechanism is probably more relevant for mental health outcomes. There may also be indirect effects, however, which blur this distinction to some extent. For example, there is evidence that social support leads to a faster recuperation after physical illness (Berkman et al. 2000), but this could in part be due to better mental health, which leads to better coping strategies in times of illness.

Another distinction is between mental health and life satisfaction. In the literature on marriage, the two concepts have been used alongside each other, and while they are generally believed to be part of the general concept of psychological well-being, they are also considered distinct (Diener et al. 1999). Mental health measures like depression and anxiety are concerned with the presence of negative mood and affect, whereas life satisfaction is concerned with the evaluation of one's life and thus includes a cognitive component. Because being married is an important goal for many people, and because there are strong societal norms supporting marriage, people may evaluate their life in a more negative way when they are single or divorced, without having many negative day-to-day feelings or depressed mood. If marriage effects are primarily found for life satisfaction, and not for mental health, this would make the interpretation of the link between marriage and health more unclear. The effects of marriage would then have more to do with norms and expectations, leading to either a more positive (when married) or more negative (when divorced) evaluation of one's life. In this paper, we address these issues by examining and comparing multiple outcomes; more precisely, we examine effects on general health, illness, depression, and life satisfaction.

American or European Effects?

As is clear from our overview table, the marriage protection theory has most often been tested in the United States. Some European studies have yielded negative evidence (Monden and Uunk 2013), and there have been suggestions that the theory perhaps does not apply as well to Europe. In this paper, we examine the theory of marriage protection in Switzerland. In the appendix, we compare Switzerland to the United States with respect to some key cultural, economic, and demographic indicators. The data show that Switzerland has lower marriage and divorce rates than the United States. National survey data show that 25 percent of the 40–49-year-old Swiss ever experienced a divorce, compared to 47 percent of Americans of that age. Attitude surveys show that there is more tolerance of divorce in Switzerland than in the United States, and that there are more people in Switzerland who say that marriage is outdated (although this is still a minority). Poverty rates are much higher among single-parent families than among two-parent families, but the differential is smaller in Switzerland than in the United States. Poverty rates in Switzerland are low to begin with;

Switzerland is one of the wealthiest European countries. Finally, we see that Switzerland is a less religious country than the United States.

Given the differences noted above, the question arises whether the theory of marriage protection would apply to the same extent to a Western European country like Switzerland. If we follow economic mechanisms behind marriage protection, we would expect effects to be weaker. The weaker connection between marital transitions and economic disadvantage in Europe, often attributed to the more extensive welfare state in European countries, which compensates women's income decline after divorce (DiPrete and McManus 2000), could imply that the link between marriage and health is weaker in Europe. If we follow the mechanisms of social control and social support, however, we would not expect weaker effects in Western Europe. These two consequences of marriage are general enough to produce a marriage protection effect in Western Europe as well.

Marriage and Cohabitation

Some authors have examined differences between unmarried cohabitation and marriage in terms of health outcomes. American studies do not find clear differences (Musick and Bumpass 2012), and European studies find weaker effects of cohabitation on life satisfaction but only in contexts where cohabitation is uncommon (Soons and Kalmijn 2009). Theoretically, several hypotheses have been suggested. Unmarried cohabitation is often a trial stage before marriage, and dissolution rates are consequently much higher (Kiernan 2002). Because there is less commitment, more uncertainty, and a lower tendency to engage in joint activities, in the average cohabiting union, one would expect less support and weaker social control in cohabiting unions (Musick and Bumpass 2012; Soons, Liefbroer, and Kalmijn 2009). Because cohabitation is often considered as a trial stage before marriage, the emotional impact of breaking up a cohabiting union may also be weaker, since expectations about the future of the union were lower to begin with (Kamp Dush 2013). Although it is not the main topic of this paper, we do examine some of the differences between marriage and cohabitation.

Data and Methods

Data

The analyses in this paper are based on data from the Swiss Household Panel (FORS 2009). The panel was based on a nationally representative sample of 5,074 households in the Swiss population. Data were collected annually of all adult household members via telephone from 1999 up to 2014 (16 years). In 2004, a refreshment sample of 2,538 households was added; this sample is used here as well. Telephone interviewing is a standard method in Switzerland because face-to-face fieldwork would be extraordinarily expensive in that country. The individual-level annual response rate for the initial sample varied from 81 to 89 percent in

the 1999–2014 period. Non-responding persons were approached again in each year. The initial response rate at the household level was 64 percent. Details can be found on the SHP website (http://forscenter.ch/en/our-surveys/swiss-household-panel/). The degree of selectivity of the non-response with respect to socio-economic and demographic variables is not higher than elsewhere, except for the very young (15–24), who had a relatively low follow-up (Lipps 2007).

The number of unique respondents in the data was 16,493. We excluded persons who participated only once (remaining $n = 13,781$). We next excluded people with missing data on the partner variables, people who were below 18 or over 65, and people who were widowed. After these selections, the number of unique persons was 11,429. Means and standard deviations of all variables are printed in table 2.

Table 2. Descriptive Statistics of Independent Variables

	Mean	SD	Min	Max	Count
Index of illness	0.001	1.002	−0.764	6.142	85,280
Depressive feelings	0.008	1.002	−0.986	3.914	90,685
General health index	−0.005	1.002	−5.593	1.688	90,744
Life satisfaction	−0.018	1.012	−5.704	1.467	85,248
Wave	8.740	4.618	1	16	90,747
Woman vs. man	0.554	0.497	0	1	90,747
Age 25–34	0.167	0.373	0	1	90,747
Age 35–44	0.254	0.435	0	1	90,747
Age 45–54	0.263	0.440	0	1	90,747
Age 55–64	0.198	0.399	0	1	90,747
Education[a]	13.207	2.665	9	18	89,226
Employed	0.834	0.372	0	1	90,747
In school	0.031	0.173	0	1	90,747
Children at home	0.401	0.490	0	1	90,727
City residence	0.204	0.403	0	1	90,514
Union formation	0.197	0.398	0	1	28,131
Unmarried (entry data)	0.116	0.320	0	1	28,131
Log duration	0.220	0.574	0	2.708	28,131
Union dissolution	0.063	0.244	0	1	55,299
x cohabitation	0.024	0.154	0	1	55,299
Log duration	0.066	0.321	0	2.708	55,299
Unmarried (exit data)	0.109	0.311	0	1	55,299

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.
[a]Missing values for education were imputed first by using the within-person average, and if still missing, via regression imputation based on age, sex, city residence, and having children.

Marital Transition Effects

To analyze the data, we first define episodes, that is, specific periods in a person's life as observed during the panel. There are episodes that consist of a single state and a subsequent married state. There are also episodes consisting of a married state followed by a divorced state. Two data files were constructed. The "entry data" contain episodes from being single to being married, while the "exit data" contain episodes from being married to being divorced. If people were single during the entire panel, this episode is included in the entry data. If people were cohabiting/married during the entire panel, this episode is included in the exit data.

A person can contribute episodes to both datasets, but a person can also have multiple episodes within the entry data or within the exit data. For example, a person who is single, marries, divorces, and remarries has two episodes in the entry data (single to married, and divorced to remarried). A person obtains a new ID in a new episode, so this is recognized as a new change in the fixed-effects model (see below). We exclude (the small number of) persons who experienced four or more events to simplify the analyses ($n = 34$). We also excluded one-year cohabiting unions (i.e., a person who is single, lives together in the next year without being married, and is single again the subsequent year). The entry data contain 4,821 unique persons and a total of 1,368 transitions from singlehood to marriage. The exit data contain 7,210 unique persons and 954 dissolutions. A total of 1,444 persons experienced one event, 283 experienced two events, and 104 experienced three events (2,322 events in total = 1,368 + 954). The numbers of persons in the regression tables are somewhat lower due to missing values, and this varies among dependent variables. Because the number of missing cases is small, we abstain from using advanced models of missing data imputation.

To analyze the effects of entry and exit in a dynamic fashion, several options are available. Some authors use growth-curve models that consider levels and changes of health for each individual (Strohschein 2005). An alternative is to include duration effects in a fixed-effects framework (Soons, Liefbroer, and Kalmijn 2009; Yap, Anusic, and Lucas 2012). While the fixed-effects approach disregards differences in baseline levels between individuals, this issue is of no importance in studying the effects of marriage and divorce. To estimate the fixed-effects model, the data are converted into a long format (a person-period file) that has a record for each person in each year during the episodes as defined above.

In our fixed-effects model for the entry data, we start with an effect of marriage entry. By definition of the fixed-effects model (Petersen 2004), this effect compares the health of persons in the pre-marriage part of the episode to the health of these persons in the married part of the episode. Note that the complete pre-marriage period is not observed, only the part that occurs during the panel. Next, we add a variable for the number of years a person was in a marriage. The first year of a marriage is coded 0, the second year is coded 1, and so on. Those who are still (or always single) obtain a 0 on the duration variable. This is necessary to (a) estimate the duration effect *together with* the transition effect, and (b)

improve the interpretation of the transition effect. By coding the first year of marriage to 0, the transition effect applies to the first year. We expect a positive transition effect on health, a positive duration effect if protection plays a role, and a negative duration effect if adjustment plays a role. We include a variable indicating whether a person is living together unmarried. In our specification, the main effect of union formation refers to the effect of marriage and the cohabitation variable tells us if the effect is weaker for cohabiting unions than for married unions.

To analyze the exit data, we first include a variable indicating that a person makes a transition from living with a partner to being single. This effect reflects the difference in the health of persons during a marriage and the health of these persons after the marriage ended. Next, we count the number of years a person has been single (after divorce). The first year of divorce is coded 0, the second year is coded 1, and so on. Duration is assigned to 0 for people who are or remain with their partner. We expect a negative transition effect on health, a negative duration effect if (the absence of) protection plays a role, and a positive duration effect if adjustment takes place. The first wave before the divorce is excluded from the data, since this year is part of the divorce process and will already show declines in health. Including this "crisis year" in the married period would not be "fair" to marriage. Excluding more years before the crisis year may lead to further increases in the divorce estimate, but it is unclear whether possible health problems in these earlier years were consequences of the impending divorce or causes of the divorce. We also considered excluding a "honeymoon" year from the entry data (deleting the first year before marriage entry), but this did not change the transition and duration effects. We include an interaction of dissolution and the legal status of the dissolved union. The main effect of dissolution refers to divorce, and the interaction tells us if the dissolution of a cohabiting union has a weaker effect on health than the dissolution of a married union.

We further considered both linear and loglinear specifications of the duration effect. Based on the *F*-tests, we saw that the loglinear specification was a little bit better (the natural log of duration +1). To assess how realistic our loglinear specification is, we also estimated duration models using a single indicator variable for each duration. These models are not very parsimonious, so we display the results graphically in figures 1 and 2. We also plotted the linear estimates in the graphs. Predicted values were calculated holding constant all covariates at their means. In the figures, the year 0 refers to the pre-transition period, 1 is the first wave after the transition, and so forth. As will be seen later, the loglinear estimates follow the year-to-year fluctuations closely.

Testing Entry versus Exit

To test if entry and exit have different effects, we pooled the entry and exit data and used interaction effects for the type of data (entry versus exit) and the independent variables. To estimate the fixed-effects model correctly on the pooled data, we assigned unique identification numbers for entry and exit episodes. We

recoded the divorce variable in the exit data; being divorced is coded −1 rather than +1. As a result, the effects of entry and exit will have the same direction and can be compared by using an interaction effect between the marital transition variable and a variable indicating which type of data the transition came from (entry versus exit). Similarly, we reversed the duration variable for divorce by multiplying it by −1. As a result, the sign of the duration effects is the same for entry and exit. All other independent variables are also interacted with the entry versus exit variable.

Pooling the entry and exit data creates dependencies in the data. The table below shows how the data are set up. For example, a person who marries during the panel will be in the entry data, but for the married part (and a possible dissolution later), s/he will also be in the exit data. We treat these two episodes as if these were different individuals; hence, these episodes get a unique fixed-effects ID. To solve the dependency between these two episodes, we corrected the standard errors for the clustering of persons; hence, these episodes get the same cluster ID. Fixed-effects models in STATA allow for a combined use of a panel ID (for episodes) and a cluster ID (for persons).

Cluster ID (persons)	Panel ID (episodes)	Data type	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7
			Single	Single	Married	Married	Married	Single	Single
115	1,151	Entry	0	0	1	1	1	.	.
115	1,152	Exit	.	.	0	0	0	−1	−1
			Married	Married	Single	Single	Married	Married	Single
116	1,161	exit	0	0	−1	−1	.	.	.
116	1,162	entry	.	.	0	0	1	1	.
116	1,163	exit	.	.	.	.	0	0	−1

Variables

To measure general health, we combine three questions on health into a scale: (a) a question on self-rated health (on a five-point scale: "very well," "well," "so/so," "not very well," "not well at all"), (b) a question on how satisfied people are with their health (on a scale from 0 for "not at all satisfied" to 10 for "completely satisfied"), (c) a question about the degree to which people's health is an impediment for their everyday activities (on a scale from 0 for "not at all" to 10 for "a great deal"). The items were standardized and summed into a scale ($\alpha = 0.77$). Higher scores indicate better health. Using a scale of three items instead of just the single and well-known question on self-rated health has the advantage of having a more differentiated and less skewed distribution.

Our second measure is an illness index, which is a combination of illness, visits to the doctor, and use of medication. The three items are as follows: (a) the degree of suffering from an illness in the past 12 months (on a scale from 0 to 11,

where 0 is no illness), (b) the number of visits to the doctor in the past 12 months (from 0 to 30, where the highest 1 percent is topped off to reduce the influence of extreme values), and (c) the degree to which someone relies on medication to be able to function (on a scale from 0 to 11, where 0 is no medication). The items were standardized and summed into an index ($\alpha = 0.65$).

To measure mental health, we use a single-item question on depression. Persons were asked how often they had "negative feelings such as feeling disheartened, desperate, anxious, or depressed." Persons could answer on an 11-point scale where 0 means "never" and 10 means "always." As one would expect, the distribution of this variable is skewed (table 2). More elaborate depression scales are not included in the SHP.

Fourth, we use a measure of life satisfaction. This was based on the question "in general, how satisfied are you with your life?" on a scale from 0 for "not at all satisfied" to 10 for "completely satisfied." Note that the dependent variables have missing values, but the number of cases is rather small, as can be seen in table 2. We decided not to apply listwise deletion across tables, since that would result in an unnecessary reduction of the number of cases. Each table therefore uses a slightly different sample.

Control variables are: age (in 10-year categories), living at home (only in the entry models), having children at home, living in an urban area, being enrolled in school, being employed, and years of schooling. All these variables can be relevant for health and well-being and are related to marital status. Since we (primarily) use fixed-effects models, time-constant predictors of health are not needed. Income was considered but not used, as it may mediate the effects of marriage, especially for women.

We interacted all effects with age and sex in a separate analysis. There has been much research on sex differences, but it seems that men and women are equally affected by marriage (Williams 2003), although perhaps in different ways (Simon 2002). Age interactions are explored because one would expect that divorce has a more negative effect on health when it occurs later (Williams and Umberson 2004).

Findings

The regression results are presented in table 3 for depressive feelings, in table 4 for general health, in table 5 for the illness index, and in table 6 for life satisfaction. All outcome variables are standardized in the person-period file, which means that an effect of a dummy variable can be interpreted as the most commonly used measure of an effect size, that is, Cohen's d (Borenstein et al. 2009). In the present model, Cohen's d is the health change following a change in marital status within persons expressed in standard deviations of health. The advantage of using this approach is that the strength of the effect can be evaluated by itself (how strong is the effect?) and compared across outcomes (for which outcome is the effect the strongest?).

To standardize the effect, we can use the variance between persons, within persons, or the total variance in the person-period file. Looking only at the

Table 3. Fixed- and Random-Effects Regression of Depressive Feelings

	(1) Entry re	(2) Entry fe	(3) Entry fe	(4) Exit re	(5) Exit fe	(6) Exit fe
Age 25–34	0.006 (0.784)	−0.042~ (0.079)	−0.050* (0.042)	−0.010 (0.829)	0.043 (0.441)	0.060 (0.286)
Age 35–44	0.084* (0.001)	−0.014 (0.702)	−0.041 (0.293)	0.079 (0.101)	0.171* (0.004)	0.193* (0.001)
Age 45–54	0.175* (0.000)	0.047 (0.336)	0.005 (0.928)	0.148* (0.002)	0.272* (0.000)	0.303* (0.000)
Age 55–64	0.247* (0.000)	0.131* (0.027)	0.081 (0.199)	0.195* (0.000)	0.367* (0.000)	0.407* (0.000)
Education	−0.007* (0.049)	0.001 (0.745)	0.001 (0.845)	−0.014* (0.000)	0.000 (0.957)	0.003 (0.726)
Employed	−0.180* (0.000)	−0.089* (0.004)	−0.089* (0.004)	−0.089* (0.000)	−0.048* (0.004)	−0.048* (0.003)
In school	−0.158* (0.000)	−0.075* (0.033)	−0.075* (0.032)	−0.095~ (0.077)	−0.099~ (0.080)	−0.099~ (0.085)
Children at home	0.018 (0.284)	0.033~ (0.092)	0.024 (0.233)	−0.003 (0.821)	−0.028~ (0.056)	−0.030* (0.042)
City residence	0.044* (0.035)	−0.018 (0.511)	−0.016 (0.560)	0.026 (0.236)	−0.049 (0.169)	−0.046 (0.188)
Union formation	−0.168* (0.000)	−0.121* (0.000)	−0.176* (0.000)			
Unmarried	0.071* (0.003)	0.040 (0.110)	0.068* (0.011)	0.055* (0.009)	−0.005 (0.857)	0.004 (0.882)
Log duration			0.053* (0.003)			
Union dissolution				0.370* (0.000)	0.301* (0.000)	0.445* (0.000)
x cohabitation				−0.145* (0.008)	−0.232* (0.000)	−0.245* (0.000)
Log duration						−0.186* (0.000)
Constant	0.251* (0.000)	0.138* (0.026)	0.161* (0.010)	0.065 (0.321)	−0.227* (0.038)	−0.280* (0.010)
Mean Y	0.07	0.07	0.07	−0.04	−0.04	−0.04
SD Y	1.00	1.00	1.00	0.99	0.99	0.99
Effect size overall	0.17	0.12	0.18	0.37	0.30	0.45
Effect size within		0.18	0.26		0.44	0.66
N Person-periods	27,376	27,376	27,376	53,940	53,940	53,940
N Persons	4,615	4,615	4,615	7,190	7,190	7,190
Rho	0.51	0.58	0.58	0.54	0.60	0.60
F-test		4.8	5.3		20.3	24.1

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.

p-values in parentheses.

~$p < 0.10$ *$p < 0.05$.

Table 4. Fixed- and Random-Effects Regression of General Health

	(1) Entry re	(2) Entry fe	(3) Entry fe	(4) Exit re	(5) Exit fe	(6) Exit fe
Age 25–34	−0.086*	−0.105*	−0.098*	−0.039	−0.103~	−0.106*
	(0.000)	(0.000)	(0.000)	(0.379)	(0.051)	(0.044)
Age 35–44	−0.281*	−0.346*	−0.322*	−0.210*	−0.300*	−0.305*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age 45–54	−0.480*	−0.561*	−0.523*	−0.382*	−0.491*	−0.498*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age 55–64	−0.651*	−0.756*	−0.710*	−0.528*	−0.676*	−0.684*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education	0.017*	0.006	0.007	0.016*	−0.019*	−0.020*
	(0.000)	(0.161)	(0.129)	(0.000)	(0.006)	(0.005)
Employed	0.228*	0.098*	0.098*	0.151*	0.102*	0.102*
	(0.000)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
In school	0.250*	0.103*	0.103*	0.257*	0.220*	0.220*
	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)	(0.000)
Children at home	0.040*	0.039*	0.047*	0.042*	0.053*	0.053*
	(0.019)	(0.047)	(0.018)	(0.002)	(0.000)	(0.000)
City residence	−0.026	−0.019	−0.021	0.012	0.070~	0.070~
	(0.201)	(0.484)	(0.442)	(0.584)	(0.051)	(0.053)
Union formation	−0.050*	−0.064*	−0.015			
	(0.037)	(0.014)	(0.627)			
Unmarried	−0.016	0.004	−0.021	−0.032	0.019	0.017
	(0.538)	(0.878)	(0.464)	(0.130)	(0.494)	(0.533)
Log duration			−0.048*			
			(0.013)			
Union dissolution				−0.129*	−0.070~	−0.099*
				(0.000)	(0.053)	(0.011)
x cohabitation				0.023	0.091	0.093
				(0.657)	(0.146)	(0.136)
Log duration						0.037
						(0.104)
Constant	−0.174*	0.134*	0.113~	−0.040	0.546*	0.557*
	(0.001)	(0.035)	(0.077)	(0.531)	(0.000)	(0.000)
Mean Y	0.03	0.03	0.03	−0.01	−0.01	−0.01
SD Y	1.01	1.01	1.01	1.00	1.00	1.00
Effect size overall	0.05	0.06	0.02	0.13	0.07	0.10
Effect size within		0.09	0.03		0.10	0.15
N Person-periods	27,396	27,396	27,396	53,975	53,975	53,975
N Persons	4,615	4,615	4,615	7,190	7,190	7,190
Rho	0.50	0.58	0.58	0.55	0.61	0.61
F-test		20.2	18.6		49.0	45.8

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.
p-values in parentheses.
~$p < 0.10$ *$p < 0.05$.

Table 5. Fixed- and Random-Effects Regression of Illness Index

	(1) Entry re	(2) Entry fe	(3) Entry fe	(4) Exit re	(5) Exit fe	(6) Exit fe
Age 25–34	0.050* (0.005)	0.022 (0.287)	0.018 (0.382)	−0.010 (0.831)	−0.011 (0.858)	−0.011 (0.859)
Age 35–44	0.208* (0.000)	0.136* (0.000)	0.123* (0.002)	0.093~ (0.056)	0.094 (0.154)	0.094 (0.152)
Age 45–54	0.393* (0.000)	0.279* (0.000)	0.258* (0.000)	0.221* (0.000)	0.220* (0.001)	0.220* (0.001)
Age 55–64	0.602* (0.000)	0.472* (0.000)	0.447* (0.000)	0.383* (0.000)	0.399* (0.000)	0.399* (0.000)
Education	−0.011* (0.000)	−0.002 (0.645)	−0.002 (0.596)	−0.015* (0.000)	0.018* (0.048)	0.018* (0.049)
Employed	−0.323* (0.000)	−0.199* (0.000)	−0.199* (0.000)	−0.225* (0.000)	−0.155* (0.000)	−0.155* (0.000)
In school	−0.339* (0.000)	−0.191* (0.000)	−0.191* (0.000)	−0.281* (0.000)	−0.220* (0.000)	−0.220* (0.000)
Children at home	−0.041* (0.013)	−0.028 (0.156)	−0.033 (0.107)	−0.085* (0.000)	−0.080* (0.000)	−0.080* (0.000)
City residence	0.041* (0.046)	0.051~ (0.073)	0.052~ (0.068)	−0.010 (0.656)	−0.028 (0.507)	−0.028 (0.507)
Union formation	−0.018 (0.454)	0.021 (0.413)	−0.003 (0.917)			
Unmarried	0.016 (0.532)	−0.009 (0.727)	0.004 (0.901)	0.009 (0.692)	−0.035 (0.246)	−0.035 (0.247)
Log duration			0.025 (0.166)			
Union dissolution				0.133* (0.000)	0.084* (0.044)	0.085~ (0.055)
x cohabitation				−0.048 (0.371)	−0.058 (0.378)	−0.058 (0.377)
Log duration						−0.001 (0.962)
Constant	0.225* (0.000)	0.027 (0.666)	0.038 (0.542)	0.254* (0.000)	−0.248~ (0.060)	−0.248~ (0.060)
Mean Y	−0.04	−0.04	−0.04	0.02	0.02	0.02
SD Y	0.97	0.97	0.97	1.01	1.01	1.01
Effect size overall	0.02	0.02	0.00	0.13	0.08	0.09
Effect size within		0.03	0.00		0.11	0.13
N Person-periods	25,834	25,834	25,834	50,213	50,213	50,213
N Persons	4,597	4,597	4,597	7,140	7,140	7,140
Rho	0.46	0.55	0.55	0.49	0.56	0.56
F-test		7.8	7.3		25.1	23.2

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.

p-values in parentheses.

~$p < 0.10$, *$p < 0.05$.

Table 6. Fixed- and Random-Effects Regression of Life Satisfaction

	(1)	(2)	(3)	(4)	(5)	(6)
	Entry re	Entry fe	Entry fe	Exit re	Exit fe	Exit fe
Age 25–34	−0.200*	−0.136*	−0.129*	0.030	−0.004	−0.038
	(0.000)	(0.000)	(0.000)	(0.563)	(0.944)	(0.551)
Age 35–44	−0.321*	−0.170*	−0.143*	−0.088~	−0.159*	−0.204*
	(0.000)	(0.000)	(0.001)	(0.096)	(0.015)	(0.002)
Age 45–54	−0.342*	−0.142*	−0.100~	−0.130*	−0.240*	−0.301*
	(0.000)	(0.008)	(0.074)	(0.014)	(0.000)	(0.000)
Age 55–64	−0.303*	−0.111~	−0.061	−0.127*	−0.294*	−0.371*
	(0.000)	(0.096)	(0.387)	(0.019)	(0.000)	(0.000)
Education	0.006~	−0.008~	−0.007	0.008*	0.001	−0.003
	(0.088)	(0.083)	(0.106)	(0.019)	(0.947)	(0.668)
Employed	0.290*	0.212*	0.211*	0.064*	0.069*	0.070*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
In school	0.302*	0.208*	0.208*	0.088	0.091	0.089
	(0.000)	(0.000)	(0.000)	(0.158)	(0.175)	(0.187)
Children at home	0.027	0.024	0.033	−0.046*	−0.014	−0.011
	(0.142)	(0.259)	(0.132)	(0.001)	(0.370)	(0.479)
City residence	−0.036~	−0.007	−0.009	−0.079*	−0.025	−0.030
	(0.099)	(0.812)	(0.767)	(0.001)	(0.536)	(0.454)
Union formation	0.232*	0.164*	0.213*			
	(0.000)	(0.000)	(0.000)			
Unmarried	−0.081*	−0.048~	−0.074*	−0.121*	−0.064*	−0.078*
	(0.002)	(0.093)	(0.013)	(0.000)	(0.033)	(0.009)
Log duration			−0.049*			
			(0.009)			
Union dissolution				−0.632*	−0.533*	−0.758*
				(0.000)	(0.000)	(0.000)
x cohabitation				0.281*	0.351*	0.369*
				(0.000)	(0.000)	(0.000)
Log duration						0.303*
						(0.000)
Constant	−0.308*	−0.147*	−0.170*	0.098	0.242*	0.342*
	(0.000)	(0.031)	(0.014)	(0.145)	(0.039)	(0.004)
Mean Y	−0.12	−0.12	−0.12	0.06	0.06	0.06
SD Y	1.04	1.04	1.04	0.97	0.97	0.97
Effect size overall	0.23	0.16	0.21	0.63	0.53	0.76
Effect size within		0.23	0.30		0.75	1.07
N Person-periods	25,822	25,822	25,822	50,197	50,197	50,197
N Persons	4,596	4,596	4,596	7,140	7,140	7,140
Rho	0.49	0.57	0.57	0.53	0.59	0.60
F-test		10.0	10.0		21.3	28.2

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.

p-values in parentheses.

~p < 0.10 *p < 0.05.

within-person variance will yield higher effect sizes because much of the variance is between persons. A random-intercept model (without any covariates) shows that a little bit more than half of the variance in health is between persons (54.7 percent for depression, 56.1 percent for general health, 52.5 percent for illness, and 54.6 percent for life satisfaction). We therefore present two effect sizes, one based on the total variance (the standard deviation in the person-period file) and one based on the within-person variance. The latter effect size can be interpreted as the strength of the effect relative to how much people change, and the former effect size can be interpreted as the strength of the effect relative to how much people differ. Both are meaningful.

Depression

In the fixed-effects model 2 of table 3, we see that marriage entry leads to a significant decline in depressive feelings ($d = 0.12$). The magnitude of the effect is quite small if we follow the conventional standards regarding effect sizes (Lipsey and Wilson 2001, 147). An effect size of $d = 0.20$ and lower is regarded as small and comparable to a correlation of $r = 0.10$. In model 5, we see that divorce is associated with a significant increase in depressive feelings ($d = 0.30$). An effect size of 0.30 is usually considered modest (it corresponds to a correlation coefficient of about $r = 0.15$). The effect size based on the within-person variance is still small ($d = 0.18$).

If we add the crisis year to the data (which is often included in the marriage period in prior studies), the effect of divorce decreases from $d = 0.30$ to 0.24. Hence, including the crisis year in the data—which isn't "fair to marriage"—indeed leads to an underestimate of the divorce effect. The random-effects estimates in models 1 and 4 are both somewhat larger than the corresponding fixed-effects estimates in models 2 and 5. This may be due to the selection of non-depressed individuals into a union and the selection of depressed individuals into divorce.

Because of the cohabitation variables in the model, the transition variables implicitly apply to marriage. Are effects weaker for unmarried cohabitation? The entry into cohabitation has a weaker effect, in the sense that it leads to a smaller reduction of depressive feelings. The difference is significant in model 1 but not in model 2. Similarly, the exit from a cohabiting union has a considerably smaller effect than the exit from a marriage. The implied effect of cohabitation dissolution is $d = 0.301 - 0.232 = 0.069$. The weaker—but not absent—effects of cohabitation are in line with the notion of lower investments in the relationship when couples live together without being married (Musick and Bumpass 2012).

To what extent does mental health change once a person is married? And what happens to mental health in the years after divorce? Models 3 and 6 include duration effects. Model 3 shows that there is a significant increase in depressive feelings after a person enters a marriage. In other words, marriage leads to an improvement in mental health, but that gain is reduced as the marriage goes on. Figure 1a shows that there is a rather slow adjustment process. In model 6, we see a significant negative duration effect on depression after divorce. This shows that people initially become more depressed after divorce

but then adjust to the divorce transition. Figure 2a shows considerable recovery in the first five post-divorce years. Note that the transition effects of marriage and divorce themselves both increase when we include duration effects (compare models 2 and 3 and models 5 and 6). The reason for this change is that they now refer to the *immediate* effects of transitions. In the conventional fixed-effects model, the entire post-transition period is used to estimate the effect.

How do the effects of entry and exit compare? We see that the positive effect of divorce is 2.5 times stronger than the negative effect of marriage entry (model 2 versus 5). The immediate effect of exit is also 2.5 times stronger than the immediate effect of entry (model 3 versus 6). A test using interaction effects on the pooled data shows that both differences are statistically significant at the 1 percent level ($t = 4.28$ for the overall effect, without controlling for duration, and $t = 5.81$ for the immediate effect). In other words, exit is more harmful than entry is beneficial. The duration effect is significantly stronger as well for divorce, showing that adjustment to loss goes more quickly than adjustment to gain ($t = 4.30$).

General Health and Illness

We now turn to our two broader measures of health: the index of general health (table 4) and the index of illness (table 5). In model 2 of table 4, we see a slight effect of marriage entry on general health but the effect is the opposite of what one would expect. Model 3 shows that there is a negative effect of marriage duration on health, but since there is no initial increase in health, this cannot be interpreted in terms of adjustment. The results for divorce are somewhat clearer. In model 5, there is a negative effect of divorce on general health but this is only marginally significant. Moreover, the divorce effect is very small and smaller than the divorce effect on depressive feelings ($d = 0.07$ versus $d = 0.30$). This conclusion does not change when we use the within-person variance to evaluate the effect size. Model 6 reveals no significant duration effect, and we also see no interaction with cohabitation. When we compare entry and exit, we see that the difference in the two effects is statistically significant ($t = 3.37$, $p = 0.01$ for the model without duration, and $t = 2.92$, $p = 0.04$, for the model with duration). Given that there are no positive effects of entry, this was to be expected.

In table 5, we present the results for illness. The illness index is strongly correlated with general health ($r = -0.61$). We see no effect of marriage entry, no effects of duration, and no interactions with cohabitation. There is a significant increase in illness after divorce, in line with expectations, but the magnitude of this effect is again trivial ($d = 0.08$). We note that some of the control variables, like age, do have strong effects on the illness index, suggesting that it is not the dependent variable that is somehow insensitive to change. The results for illness parallel the results for general health and suggest, in combination, that marital transitions do not change people's health in any substantial way.

The health measures may in part reflect mental aspects of health. For this reason, it is instructive to see what happens to the effects of divorce on health when we control for depression. This model removes the mental dimension of the overall health measure and may give us some clue about which aspect of health

is affected. We have to keep in mind, however, that depression may also be the *result* of poor physical health, especially when chronic conditions are involved (Bisschop et al. 2004). If this is true, it would not be valid to "control" for mental health. To be complete, we did the "reverse" exercise as well: we estimated models for depression where general health is taken into account, thus removing possible physical causes of mental problems. The immediate effect of divorce on general health disappears when we take depression into account (from −0.099 to 0.004). In contrast, the immediate effect of divorce on depression hardly changes when we take general health into account (0.445 to 0.421). We regard this as evidence that the health effects of marital transitions are primarily mental in nature.

Life Satisfaction

In table 6, we consider life satisfaction. In line with expectations, marriage entry leads to an increase in life satisfaction followed by a decline during the marriage (model 3). Figure 1d shows that there is no return to the premarital level when using the loglinear estimates. This is consistent with an earlier long-term panel analysis that showed that marriage has a *lasting* positive effect on life satisfaction, in contrast to setpoint ideas (Soons, Liefbroer, and Kalmijn 2009). The effect of divorce on life satisfaction is significant as well, and strong: the overall effect is $d = 0.53$ and the immediate effect is $d = 0.76$. When using the within-person variance for the calculation, these effects are even stronger ($d = 0.57$ and 1.07). Adjustment is again strong; after 5–7 years since the divorce, the gap becomes

Figure 1. Changes in health and well-being after marriage entry
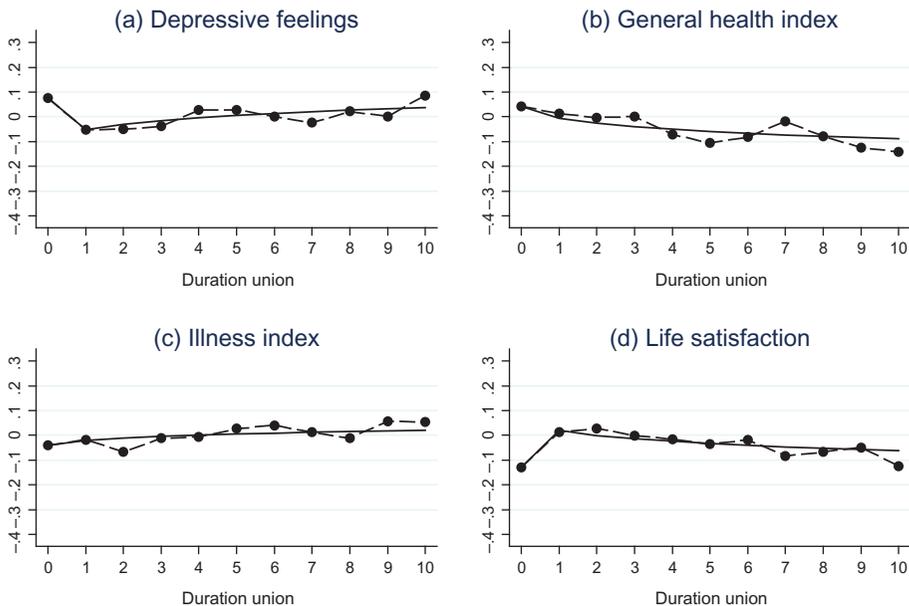
Source: SHP multivariate analyses

Figure 2. Changes in health and well-being after marriage exit
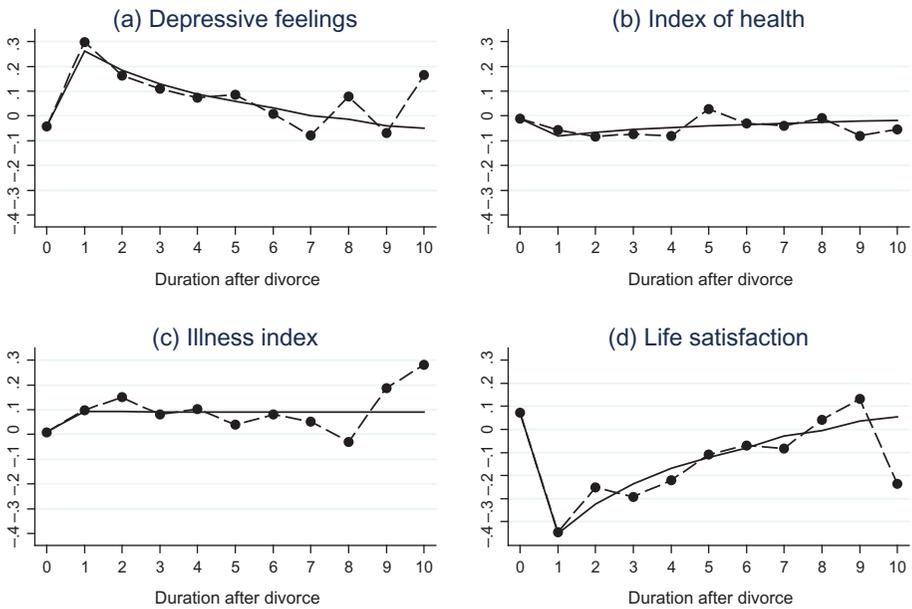
Source: SHP multivariate analyses

very small (figure 2d). For both entry and exit, we see that unmarried cohabitation has weaker effects. The gain in life satisfaction after union entry is smaller—but not absent—when people are not married, and the decline is smaller when people leave a cohabiting union compared to when they leave a marriage.

When we compare the effects of entry and exit directly, we see that the exit effect on life satisfaction is 3.3 times as strong as the entry effect. This is similar when we look at the immediate effects (3.6 times as strong). Both differences are statistically significant ($t = 6.37$ and $t = 8.47$, $p < 0.01$). The duration effect is also significantly stronger for divorce ($t = 7.42$). These results for life satisfaction thus confirms the analysis of depressive feelings: effects of loss are larger than effects of gain.

To what extent is life satisfaction a reflection of depressive feelings? And which mental aspect is most affected by marriage? To answer these questions, we explored a model for life satisfaction with depression controlled. When we add depression to the model for life satisfaction, the effect of divorce on life satisfaction declines from −0.758 to −0.657. When we do this exercise for marriage entry, we see that the effect declines from 0.213 to 0.157 when controlling for depression. Since both these changes are modest, we conclude that marital transitions affect life satisfaction over and beyond the effect they have on mental health.

Interactions?

Finally, we test interactions by gender and age (table 7). Models 3 and 6 are used for estimating the interactions. The interactions show that the impact of

Table 7. Fixed-Effects Regression with Age and Sex Interactions

	(1) Depressive feelings	(2) General health index	(3) Index of illness	(4) Life satisfaction	(5) Depressive feelings	(6) General health index	(7) Index of illness	(8) Life satisfaction
Union formation	−0.173* (0.000)	−0.048 (0.177)	−0.009 (0.802)	0.201* (0.000)				
Log duration	0.052* (0.003)	−0.053* (0.007)	0.031~ (0.073)	−0.058* (0.002)				
Woman × union	−0.012 (0.744)	0.046 (0.219)	0.039 (0.324)	−0.009 (0.820)				
Age × union	0.016 (0.712)	0.058 (0.191)	−0.081 (0.108)	0.098* (0.034)				
Union dissolution					0.448* (0.000)	−0.084 (0.175)	0.097 (0.117)	−0.930* (0.000)
Log duration					−0.185* (0.000)	0.034 (0.126)	0.004 (0.861)	0.283* (0.000)
Woman × dissolution					−0.001 (0.987)	−0.053 (0.349)	0.028 (0.635)	0.185* (0.020)
Age × dissolution					−0.005 (0.928)	0.031 (0.514)	−0.048 (0.350)	0.109~ (0.090)
Person-periods	27,376	27,396	25,834	25,822	53,940	53,975	50,213	50,197
Persons	4,615	4,615	4,597	4,596	7,190	7,190	7,140	7,140
Rho	0.58	0.58	0.55	0.57	0.60	0.61	0.56	0.60
F-test	4.6	16.5	6.6	9.1	22.4	42.6	21.5	26.3

Source: Swiss Household Panel 1999–2014, own analyses on person-period file.

p-values in parentheses.

~$p < 0.10$ *$p < 0.05$.

marriage is not gender specific. Of the eight interactions with transition effects, only one is significant. Divorce appears to have a less negative effect on women's life satisfaction than on men's. Age is dichotomized in table 6, so that main effects and interactions are easier to interpret. Only two of the eight age interactions are significant. The effects of entry on life satisfaction are stronger for older persons, while effects of exit are weaker for older persons. Keep in mind that we do not include older adults (65+) in our analysis (table 7).

Conclusions

The analyses in this paper yield a clear pattern of results. First, the impact of "loss" is about two to three times stronger than the impact of "gain." In many cases, the effects of gain (marriage entry) are very small. Second, after marriage entry and after marriage exit, there is adjustment and no accumulation. In other words, health does not improve during marriage, nor does it deteriorate while being single after divorce. Especially after divorce, we find recovery over the years. Third, the results are sensitive to the outcome that we consider. Effects are strongest for life satisfaction, weaker for mental health, and almost absent for two health measures.

What do these results tell us about the underlying theories linking marriage to health? In general, we believe that our findings can be interpreted as evidence against the notion of health protection. If marriage would protect a person's health, we should find effects for both marriage entry and exit, but we primarily find exit effects. We should find some degree of accumulation, but we find adjustment. We should find effects on all health outcomes, but the closer we get to a pure health measure, the weaker the effects become. In our view, these findings point to several possible alternative hypotheses.

First, there is much evidence for a loss perspective, especially the strong negative divorce effects on depression and life satisfaction and the tendency to recover from this decline. Our conclusion here resembles some earlier American studies on the topic that argued that "marital status differences in health appear to reflect the strains of marital dissolution more than they reflect any benefits of marriage" (Williams and Umberson 2004, 81). Our paper has tested this difference and confirms these earlier statements. Moreover, we added the finding that adjustment is also stronger for loss than for gain. We believe that this is an important finding for high-divorce societies. Entering marriage goes together with the risk of divorce, so that the *total* effect of marriage is a function of the effect of marriage entry, the effect of marriage exit, and the risk of divorce. Given that losses are stronger than gains, and given that divorce rates are high, it is not evident that there is an overall health gain to marriage (DePaulo and Morris 2005). Obviously, such statements require more complex calculations that also take into account duration effects and remarriage patterns.

Second, the evidence suggests that marriage has more to do with mental than with physical health. Of course, the two aspects of health are related in a complex causal way (Bisschop et al. 2004), but the distinction remains important. The limitation to mental aspects of health is consistent with the loss perspective;

a divorce is not only a stressful life event, it can lead to strong negative emotions that reduce a person's mental health. When we compare the results for depression and life satisfaction, we see that the effects are stronger on satisfaction than on depression, and the effects on life satisfaction hardly change when we control for changes in depression. To us, this suggests that marriage changes people's cognitive evaluations of their life more than it affects their mood or happiness. Marriage is a highly valued goal in society, and being divorced is not a state that people aim for. This results in a poorer evaluation of one's life, without necessarily feeling more depressed. In this sense, marital transitions affect cognition more strongly than they affect emotions, although in the short term, emotions can be strongly affected as well.

We must acknowledge some limitations of the study. Although our study has the benefit of its long-term year-to-year measurement—16 years in total for most respondents—there are also data disadvantages. The depression measure was based on a single item, which is obviously less attractive than a multiple-item measure like the CESD. We do think, however, that our single depression question is the most direct question that one can ask, and in this sense, has high external validity. Another limitation is that we did not look at health behaviors. Some studies find effects of marriage on, for instance, smoking and drug use (Duncan, Wilkerson, and England 2006; Monden et al. 2003). We do not dispute these findings, but the question is how strong these effects are and how quickly they translate into health problems. Our second measure of health is based on illness, doctor visits, and the use of medication, and in that sense it also has a clear behavioral component. We note that our results for general health resemble the null findings in a European panel on self-rated health by Monden and Uunk (2013). Finally, we note the limitation of our analyses to people aged 18–65. We deliberately abstained from analyzing the elderly, since this introduces different conceptual issues (e.g., loneliness, widowhood) and makes it more difficult to compare entry and exit. Given the importance of the spouse for instrumental and emotional support during old age (Pinquart and Sorensen 2011), we do not want to generalize our negative findings to that age category.

Our data are from Switzerland and were collected in the 2000s and 2010s. This raises the question of generalizability. In terms of demographic, cultural, and economic characteristics, Switzerland is a good example of a Western European country. One may wonder if our results merely suggest that marriage effects on health are absent in Europe and not in the United States. This could be the case, for example, because divorce is more strongly related to income changes in the United States than in (some) European countries (DiPrete and McManus 2000). Moreover, income and health are also more strongly associated in the United States than in Europe (Elo 2009). As a result, it is possible that there are stronger effects of marriage on health in the United States than in Europe. For the non-economic mechanisms behind the marriage effects, however, one would still expect effects on health in a Western European setting. In this sense, Switzerland remains a good case for testing the theory. We believe our negative evidence is not unique for the Swiss case, but we welcome more European analyses of these effects. We also welcome more recent (dynamic)

American analyses of the problem, since a recent cross-sectional analysis suggested that the link between marriage and self-rated health has declined over time in the United States (Liu and Umberson 2008).

The literature on marriage and health has sometimes been criticized for overstating the evidence (DePaulo and Morris 2005; Klinenberg 2012). While we do not concur with the view that quantitative studies on the topic are ideologically biased, as is sometimes claimed (DePaulo and Morris 2005), it is true that few studies have calculated or evaluated effect sizes in a serious fashion. Effect sizes are important but also difficult to evaluate. We base our effect sizes on the work of Cohen who, somewhat reluctantly, argued that $d = 0.2$ is a small effect, $d = 0.5$ is a medium effect, and $d = 0.8$ is a large effect (Cohen 1988). These values correspond to correlations of approximately $r = 0.10, 0.25,$ and 0.37, given equal samples in the two groups. Using this standard, only the effects on life satisfaction and only of divorce can be called strong ($d = 0.75$). If we standardize based on within-person variance, the effect sizes are stronger, and then we also see a medium to strong (immediate) effect on depression ($d = 0.66$). Cohen's cutoff points are obviously not scientific, so it is also useful to compare our effects with what has been found in clinical health research. In a meta-analysis of the effects of cognitive-behavioral therapy on mental health disorders, including depression, a recent overview found effect sizes of about 0.95 (Butler et al. 2006). In these studies, the standard deviation was taken of either the control group or the pooled treatment and control groups, not the standard deviation of change in the two groups. The effects on depression that we found are clearly smaller than this reference value.

What are the implications of our findings? Empirically, we believe that it is important to do more systematic research comparing Europe and the United States. It is possible that marriage has a higher status and possibly a stronger protective function in the United States than in Europe (Cherlin 2009). This could be due to the stronger welfare state in Europe but it is also possible that the United States is more individualistic which could make primary ties like marriage more influential. Before speculating on such issues further, we need to know what the effects of marriage are on health when using similar longitudinal research designs and measures in other European countries. Theoretically, one possible implication of our findings—assuming these are more generally true—is that we have to re-evaluate our thinking about the social functions of marriage after the Second Demographic Transition (Klinenberg 2012). Perhaps it is more the nature of the marriage and the type of spouse that matters rather than marriage itself (Umberson et al. 2006). Similarly, for those who are not married, the question is how alternative sources of integration and intimate ties outside the household can help people lead happy and healthy lives (Klinenberg 2012). Finally, our research shows again how important the crisis model is for the relationship between marriage and well-being. Following the crisis and stress perspective on the life course, a better understanding of the effects of divorce on health can be obtained by paying more attention in future research to the nature of the divorce transition, the social circumstances in which it occurs, and the secondary transitions that it may involve.

Note

1. This study has been realized using the data collected by the Swiss Household Panel (SHP), which is based at the Swiss Centre of Expertise in the Social Sciences FORS. The project is financed by the Swiss National Science Foundation. For more information, see Tillman et al. (2016).

Appendix. Comparing Switzerland and the United States in Terms of Marriage Data

Indicator	Switzerland	United States
Crude marriage rate (2010)[a]	5.5	6.8
Crude divorce rate (2011)[a]	2.2	2.8
% 20–39 ever married (2000s)[b]	45.9	54.8
% 40–49 ever divorced (if married) (2000s)[b]	25.3	47.2
Cohabitation rate (20–34)[c]	40.0	29.0
% saying "marriage is outdated"[d]	25.5	12.6
"Divorce is justifiable" (scale 1–10)[d]	6.9	5.8
Attends church monthly or more	24.3	46.8
GNI per capita (PPP corrected)	57.5	50.2
Poverty rate couples with children[e]	4.5	11.0
Poverty rate single parents[e]	14.1	43.0

[a] *Demographic Yearbook of the United Nations* (2014).
[b] Pooled European Social Surveys and US General Social Surveys (pooled 2000s). Weighted %.
[c] Percentage of couples not married. OECD Family Database (for the United States, the age range is 18–34).
[d] European and World Values Survey (2005–2009), online data tool.
[e] For the United States, figures are based on female rates published in *The World's Women 2015* (United Nations 2015). For Switzerland, figures are based on individual rates in *Poverty and Material Deprivation* (Federal Statistical Office 2016).

About the Author

Matthijs Kalmijn is a professor of sociology at the University of Amsterdam and the Netherlands Interdisciplinary Demographic Institute. His research focuses on family and the life course, social stratification, and ethnicity. Recently, he received a grant from the European Research Council to study the consequences of family complexity (http://familycomplexity.eu/). Earlier versions of this paper were presented at Colloquium of the Swedish Institute for Social Research, SVS Seminar, Stockholm University, December 16, 2015, and at the 8th International Conference of Panel Data Users in Switzerland, University of Lausanne, Géopolis, June 1, 2015 (keynote). He thanks the participants of these seminars for helpful comments.

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