CrossMark

Life Satisfaction in Close Relationships: Findings from a Longitudinal Study

Kristin Gustavson[1,2] · Espen Røysamb[1,2] · Ingrid Borren[1] ·
Fartein Ask Torvik[1] · Evalill Karevold[1,2]

Abstract Life satisfaction (LS) is closely linked to romantic relationships. However, we lack knowledge on the nature of the longitudinal associations between LS and relationship quality, as well as on the longitudinal associations between two partners' LS—especially for persons in long-term relationships. Better understanding of such associations could possibly add to the existing knowledge on how to increase LS. The current study used data from 239 heterosexual couples to examine longitudinal associations between relationship quality and LS over a 3-year period. Associations between one partner's baseline LS and change in the other partner's LS from baseline to 3-year follow-up were also examined. Relationship quality predicted change in LS, and LS predicted change in relationship quality. The results also showed that one partner's LS predicted change in the other partner's LS over a 3-year period, even when controlling for both partners' baseline evaluation of relationship quality. The results suggest that a partner's general LS can increase both the couple's relationship quality and the other partner's LS over time. Further, the results also suggest that relationship quality can contribute to positive change of both partners' LS.

Keywords Relationship quality · Relationship satisfaction · Life satisfaction · Subjective well-being

1 Introduction

A large body of research has investigated the degree to which favourable life circumstances can lead to increased subjective well-being. Social relationships, and particularly romantic relationships, are often seen as potential sources of subjective well-being

---

✉ Kristin Gustavson
    kristinbrun.gustavson@fhi.no

[1] Division of Mental Health, Norwegian Institute of Public Health, P.O. Box 4404, Nydalen, 0403 Oslo, Norway

[2] Department of Psychology, University of Oslo, Oslo, Norway

(Kesebir and Diener 2009; Diener and Diener McGavran 2008). At the same time, subjective well-being may affect the quality of social relationships (Ruvolo 1998). Hence, subjective well-being and romantic relationships seem to be important for each other.

Subjective well-being "reflects the extent to which people think and feel that their life is going well" (Lucas and Diener 2008, p. 795). The affective component of subjective well-being, affective well-being, assesses a person's feelings (Diener 1984; Schimmack 2008), while life satisfaction (LS) is a global cognitive judgment of a person's life (Lucas and Diener 2009; Pavot and Diener 1993). Relationship quality has been linked to both aspects of subjective well-being (Ruvolo 1998; Dyrdal et al. 2011; Headey et al. 1991). Some argue that LS is a better measure of well-being because people are allowed to decide for themselves what criteria should be used for evaluating their life (Schimmack and Lucas 2010). In accordance with this, the current study will focus on LS in close relationships.

Intimate relationships are closely linked to LS (Diener and Diener McGavran 2008). For example, married persons show higher levels of LS than unmarried and divorced persons (Lucas 2005; Diener et al. 2000; Gustavson et al. 2013). Further, the quality of intimate relationships is also related to LS, with Hawkins and Booth (2005) reporting that relationship quality at one time point predicted LS 12 years later. To expand our knowledge on LS in close relationships, the current study aimed to examine longitudinal associations between LS and relationship quality and also to examine the degree to which one partner's LS can predict change in the other partner's LS over time. Such knowledge may contribute to understanding the development of LS and may also be important for designing intervention strategies aimed to increase people's LS and relationship quality.

1.1 Longitudinal Associations Between LS and Relationship Quality

A person's intimate relationship may be among the most important aspects of his or her life (Neyer and Lehnart 2006), and as a consequence substantially affect LS. Indeed, romantic relationships appear to be one of the most important domains for LS (Diener and Diener McGavran 2008). At the same time, LS can affect the evaluation, and subjective quality, of relationships. For example, exhibiting a favourable view of life may positively affect the way a person sees his or her intimate relationship (Headey and Veenhoven 1989). Further, high levels of LS may be associated with behaviours [e.g. increased trust in others (Kesebir and Diener 2009)] that improve the quality of an intimate relationship. Further, higher levels of LS measured at one time point is predictive of being involved in long-lasting relationships later in life (Oishi and Koo 2008), supporting the notion that LS can have positive consequences for relationship quality.

In a previous study by Ruvolo (1998), the relationship between affective well-being and relationship quality was demonstrated as bidirectional. Several studies have also indicated that the same is true for relationship quality and LS. For example, LS is associated with relationship quality both concurrently and longitudinally (Shek 1995; Dyrdal et al. 2011; Gustavson et al. 2013; Gustavson et al. 2012a; Headey et al. 1991). In addition, another study showed that after a relationship enhancement intervention, change in relationship quality predicted subsequent change in LS (Hilpert et al. 2014). Further, Dyrdal et al. (2011) and Headey et al. (1991) showed longitudinal bidirectional associations between one partner's LS and his or her own evaluation of relationship quality. Hence, previous findings suggest that relationship quality may affect LS and also that LS may affect relationship quality.

Associations between LS and relationship quality may also be affected by changes to societal factors like values, gender role expectations, or women's work participation. This

notion is supported by results from a meta-analysis using a wide well-being concept (including for example measures of depression) (Proulx et al. 2007). This meta-analysis found that studies using more recent data showed stronger associations between this well-being concept and relationship quality compared to studies using older data. This indicates that there is a need for studies using recent data to examine the degree to which LS and relationship quality predict change in each other. Headey et al. (1991) used Australian data from 1981 to 1987. Dyrdal et al. (2011) used more recent data, but only for women. In addition, all of the participants in Dyrdal's study were pregnant at baseline; hence they were in a quite specific life-phase.

Dyrdal et al. (2011) reported that relationship quality predicted change in LS to a stronger degree than LS predicted change in relationship quality among pregnant women and mothers of infants. They hypothesized that the relative magnitude of the effect from LS on relationship quality versus the effect from relationship quality on LS may be life-phase specific (Dyrdal et al. 2011). This interpretation is in accordance with the fact that Headey et al. (1991), who utilised data from Australians between 1981 and 1987, did not report differences in the magnitude of the effects from LS on relationship quality versus the effect from relationship quality on LS. The notion of life-phase specific effects involving relationship quality and LS is also in line with findings from Proulx et al. (2007) meta-analysis, reporting that longitudinal associations between a wider definition of well-being (including depression measures) and relationship quality were stronger for marriages of longer rather than shorter duration.

The current study aims to examine the degree to which relationship quality predicts change in LS and LS predicts change in relationship quality among persons in established relationships, utilising data collected between 2008 and 2011 in a sample of men and women who have been in a relationship for more than 15 years.

1.2 Can One Partner's LS Predict Change in the Other Partner's LS?

Two people living together are likely to affect each other in many ways, and "one person's worries and satisfactions may affect the partner" (Ruvolo 1998, p. 470). Several studies support this notion that individuals in a relationship affect one another. For example, one partner's evaluation of relationship quality has previously been found to predict change in the other partner's evaluation of relationship quality (Ruvolo 1998). Further, Hilpert et al. (2014) reported that after a relationship enhancement intervention, women's change in affective well-being predicted further change in men's affective well-being, and Whisman and Uebelacker (2009, p. 188) reported "contagion effects for depression in long-term marital relationships". Beach et al. (2003) reported associations between one partner's marital adjustment and the other partner's depression among married persons with adolescent children. Further, one partner's personality factors (such as emotional stability), have been found to predict the other partner's LS (Dyrenforth et al. 2010).

We have limited knowledge about the degree to which one partner's level of LS can predict subsequent change in the other partner's LS. Schimmack and Lucas (2010) have shown that two partners' LS change similarly over time in their longitudinal study following couples with 22 assessments over 21 years. Hilpert et al. (2014) further showed correlations between two partners' change in LS after participating in a relationship enhancement program. Such findings suggest that the LS of individuals within a relationship are closely linked. One partner's personal characteristics are part of the other's environment, and one partner's LS may thus be a potential environmental factor influencing the other partner's LS. One partner's LS may be important for the other partner's

LS for several reasons. For example, the other partner's LS may be an important domain that influences how a person evaluates his or her own LS. Further, intimate partners may affect each other's LS through influencing each other's way of interpreting the world.

As LS is quite stable over time (Diener et al. 2013), one partner's LS may be suspected to affect the other partner's LS only in the early stages of a relationship. However, LS is far from perfectly stable and does change over time (Diener et al. 2013). Hence, one partner's LS level at a given time point is not identical to his or her level many years earlier, supporting the notion that one partner's level of LS several years after the beginning of a relationship may be important for further change in the other partner's LS. The current study will examine the degree to which one partner's level of LS predicts change in the other partner's LS over time, even among persons who have been in the same relationship for as long as 10–20 years.

1.2.1 Possible Confounders of Associations Between Two Partners' LS

An observed association between one partner's LS and change in the other partner's LS over time does not necessarily imply a causal relationship. For example, if shared life circumstances systematically affect one partner's LS first and the other partner's LS later, a spurious association between one partner's LS and change in the other partner's LS will appear. In such a case, the observed association between one partner's LS and change in the other partner's LS is confounded by shared life circumstances. Thus, this study will include both partners' health complaints, problems with children, and the family's financial situation as control variables because these variables are seen as likely shared life circumstances that may affect both partners' LS. The partners' educational level and age will also be included as control variables.

1.3 Gender Differences

Gender differences have been extensively studied in relation to romantic relationships (Hendrick 2004). Cross-sectional findings have indicated that romantic relationships appear more important for women than for men. For example, reports have demonstrated that women show stronger cross-sectional associations between relationship quality and a broad well-being concept than men (Proulx et al. 2007). However, longitudinal studies have failed to find support for the notion that romantic relationships are more important for women than for men (Proulx et al. 2007; Beach et al. 2003; Kouros et al. 2008; Whisman and Uebelacker 2009; Headey et al. 1991).

Ruvolo (1998) reported no gender difference in longitudinal associations between two partners' evaluation of relationship quality. Hilpert et al. (2014) reported that there were no effects of one partner's LS on the other partner's LS among couples who had participated in a relationship enhancement program, neither among men nor women. Another study has reported that associations between one partner's evaluation of relationship quality and other measures in the other partner (i.e. symptoms of anxiety and depression) were very similar among men and women (Røsand et al. 2012). In addition, the gender differences in associations between one partner's personality and the other partner's LS found in some samples were not replicated in others (Dyrenforth et al. 2010). Based on these previous findings, the model in the current study will include a theoretical assumption of no gender differences in longitudinal associations involving relationship quality and LS. However, this assumption will be tested against the data to explore unexpected gender differences.

1.4 Aims

The first aim of the current study was to examine the degree to which relationship quality could predict change in LS, and vice versa, among middle-aged persons in established relationships. The second aim was to examine whether one partner's LS predicted change in the other partner's LS over a 3-year period and also whether one partner's evaluation of relationship quality predicted change in the other partner's evaluation of relationship quality over the same time period. We also wanted to explore potential gender differences in these associations.

2 Method

2.1 Sample

We used data from the Tracking Opportunities and Problems (TOPP) study (Mathiesen et al. 2009). The study was initiated in 1993 with mothers from Eastern Norway who attended 19 different community health care centers with their 18-month-old children invited to participate (T1). About 95 % of all families with children in these areas attended the health care centers. Of the invited parents, 87 % ($N = 929$) answered the questionnaires at T1. The women received further questionnaires at the centers in 1994 (T2) and 1995 (T3). Questionnaires were later sent by mail to women in 2000 (T4), 2004 (T5), 2006 (T6), 2008 (T7), and 2011 (T8). Questionnaires from the women's partners were included from 2006 (T6) when women were asked to forward separate questionnaires to them. The current study used data from the 2008 and 2011 questionnaires for both genders. Information from 2006 was not used as these questionnaires did not contain any measure of LS.

In 2011, 522 women were still participating in the study. An extensive examination of attrition from the study from 1993 to 2008 showed that the only predictor of attrition at 2008 was low educational level (Gustavson et al. 2012b). 15 other factors, such as relationship quality, psychological distress, temperament, chronic stressors, the children's temperament, the family's financial situation, and age, did not differ between those who dropped out and those who stayed in the study. Only couples who were together in 2008 and 2011 were included in the current study. The data were initially screened in scatterplots and box-plots, and three outliers were excluded. The sample consisted of 239 heterosexual couples from which 238 women and 194 men participated in 2008, and 239 women and 200 men participated in 2011. Women with responding partners in 2008 evaluated relationship quality as significantly ($p < .05$) better than women with non-responding partners. Cohen's d was .36, which is considered a small to medium effect size (Cohen 1988). Women with responding versus non-responding partners did not differ regarding LS. The finding of differences in evaluation of relationship quality among women with and without responding partners in 2008 emphasized the importance of using data analysis procedures that are in line with the Missing At Random (MAR) rather than the Missing Completely At Random (MCAR) assumption.

2.2 Measures

2.2.1 Life Satisfaction

In 2008 and 2011, both partners completed the five-item Satisfaction with Life Scale (SWLS) (Diener et al. 1985; Pavot and Diener 1993). Responses on each item are rated on a scale from

1 to 7 with 1 representing 'strongly disagree', and 7 representing 'strongly agree'. High scores represented high levels of LS. The SWLS is designed to measure overall cognitive evaluation of LS and has shown good psychometric properties (Pavot and Diener 1993; Vittersø et al. 2002). The SWLS shows good construct and convergent validity as it correlates negatively with measures of distress and positively with other measures of subjective well-being (Pavot and Diener 1993). The SWLS has been found to be one-dimensional, and temporal stability of .54 over 4 years has been reported (Pavot and Diener 1993). The mean score of the five items was calculated. Cronbach's alpha was .91 for men in 2008 and .90 for men in 2011, and .93 for women in 2008 and .92 for women in 2011. Among women, skewness was −1.38 in 2008 and −0.98 in 2011. Among men, skewness was −1.05 in 2008 and −0.99 in 2011. Kurtosis was <3 for both men and women at both time points.

2.2.2 Evaluation of Relationship Quality

In 2008 and 2011, both partners answered five questions from the Relationship Assessment Scale (RAS) (Hendrick 1988) (e.g. "How well does your partner meet your needs?", "To what extent has your relationship met your original expectations?"). The RAS shows good criterion-related validity as it converges (between .80 and .84) with the well-known Dyadic Adjustment Scale (DAS) (Spanier 1976; Vaughn and Baier 1999; Hendrick 1988). Further, the RAS correlates with measures of love and commitment, and it also discriminates between couples who stay together and couples who break up (Hendrick 1988). The items were rated on a five-point scale. Mean scores of these five items were computed, ranging from 1 representing low relationship quality to 5 indicating high relationship quality. Cronbach's alpha in the current sample was .88 for men in 2008 and .91 for men in 2011, and .90 for women in both 2008 and 2011.

2.2.3 Covariates:

Physical health complaints: In 2008, men and women answered one question about problems with their own physical health. The scale ranged from 1 to 4, where 1 represented no problems and 4 represented very heavy problems. *Family stress related to children:* In 2008, men and women also answered three questions about stress related to children (problems with structuring the daily life, school-related problems, and problems with setting up rules for the child). The scale ranged from 1 to 4, where 1 represented no problems and 4 represented very heavy problems. The mean score was calculated for these three items for men and women separately. The mean of these two means was then used as a composite score for the couple's child related problems. Cronbach's alpha for this measure was .77. *The family's financial situation:* In 2008, women rated the family's financial situation on a four-point scale (from 'we manage very poorly' to 'we manage very well'). *Educational level and age:* Women reported on their own and partner's educational level in 1993 and 1994, respectively. Men and women reported on their own age.

2.3 Statistical Analyses

2.3.1 The Structural Equation Model

A structural model was constructed to examine the aims discussed in the introduction. The model is illustrated in Fig. 1. Paths from each partner's baseline LS to the same partner's
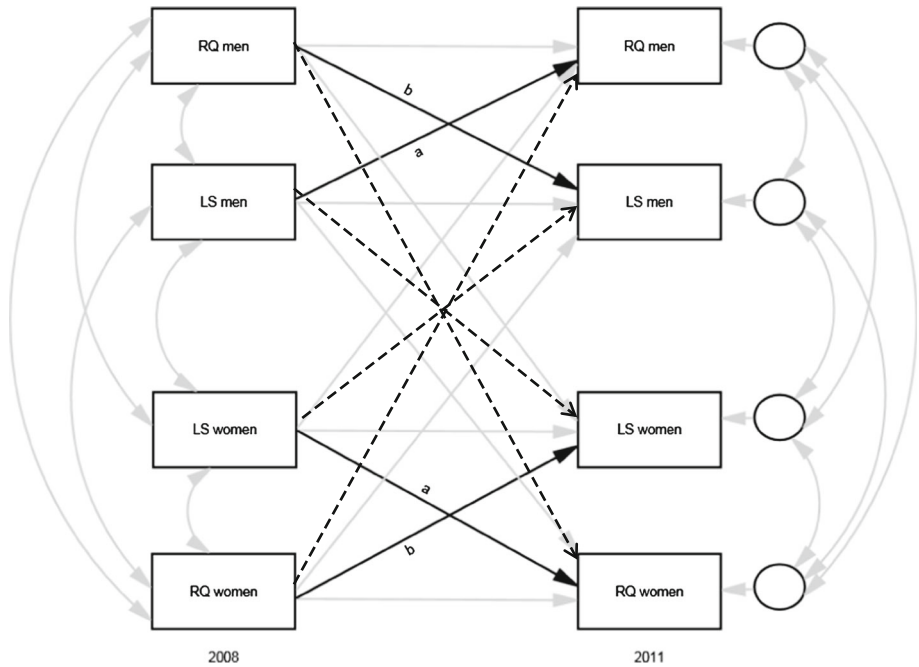
Fig. 1 The structural model constructed in Mplus to test the aims. *Notes*: *LS* life satisfaction, *RQ* relationship quality. *Black solid arrows* correspond to the research questions in aim 1 regarding longitudinal associations between LS and relationship quality. *Black dotted arrows* correspond to research questions in aim 2 regarding longitudinal associations between the two partners' LS and between the two partners' evaluation of relationship quality. *Grey arrows* represent paths that were estimated to control for alternative associations to those specified in the aims. Because the model was controlled for baseline levels of all variables, an association between one baseline variable and another follow-up variable was in fact an association between one baseline variable and *change* in the follow-up variable. Equality constraints across gender were imposed on all longitudinal paths involving LS and relationship quality. In addition, the longitudinal associations between baseline LS and follow-up evaluation of relationship quality (*paths a*) were constrained to be equal to the associations between baseline evaluation of relationship quality and follow-up LS (*paths b*). The model was adjusted for age, educational level, both partners' health complaints, child related problems, and the family's financial situation, but this is not drawn to reduce complexity of the figure

evaluation of relationship quality at follow-up were estimated. Likewise, paths from each partner's baseline evaluation of relationship quality to the same partner's LS at follow-up were also estimated. This was done to examine the research questions in aim 1 about the degree to which LS predicted change in relationship quality, and relationship quality predicted change in LS. Because the model was controlled for baseline levels of all variables, an association between one baseline variable and another follow-up variable was in fact an association between one baseline variable and *change* in the follow-up variable. Hence, a significant path from one partner's baseline LS to the same partner's follow-up evaluation of relationship quality would support the notion that LS predicts change in relationship quality. A significant path from each partner's baseline evaluation of relationship quality to the same partner's follow-up LS would support the notion that

relationship quality predicts change in LS. These paths are represented by black solid arrows in Fig. 1.

Further, paths from one partner's baseline LS to the other partner's follow-up LS and from one partner's baseline evaluation of relationship quality to the other partner's follow-up evaluation of relationship quality were also modelled. This was done to examine the degree to which one partner's LS predicted change in the other partner's LS and the degree to which one partner's evaluation of relationship quality predicted change in the other partner's evaluation of relationship quality (aim 2). These paths are represented by black dotted arrows in Fig. 1.

In addition, longitudinal paths from each main study variable in 2008 (LS and evaluation of relationship quality among men and women) to the corresponding variable in 2011 were also modelled to represent stability in LS and in evaluation for relationship quality from baseline to follow-up. Paths from one partner's baseline LS to the other partner's evaluation of relationship quality at follow-up were also allowed, as were paths from one partner's baseline evaluation of relationship quality to the other partner's follow-up LS. This was done to allow controlling for alternative associations when examining the associations specified in the aims. Residual variances in 2011 were allowed to be correlated with each other as were baseline variables. All paths that were not directly corresponding to any of the aims are represented by grey solid arrows in Fig. 1. The structural model was controlled for both partners' physical health problems, the family's child-related problems, the family's financial situation, as well as both partners' educational level and age. To reduce complexity, these control variables are not drawn in Fig. 1.

2.3.2 Deciding Whether Different Paths Should be Estimated for Men and Women

As discussed in the introduction, longitudinal associations involving LS and relationship quality were expected to be the same for men and women. Equality constraints across gender were thus imposed on longitudinal paths involving LS and relationship quality in the model shown in Fig. 1. The Chi square (χ^2), the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker–Lewis Index (TLI) were used for evaluation of fit of this constrained model. RMSEA values ≤ 0.06 and CFI and TLI values ≥ 0.95 are often seen as indicators of good fit between the data and the model (Hu and Bentler 1999). To test for possible gender differences, the fit of this model was compared to the fit of a model without equality constraints across gender. The latter model without such constraints was fully saturated with zero degrees of freedom, and thus showed perfect fit. Fit indices for a saturated model are not informative in itself, but the fit of the model with equality constraints across gender was compared to the perfect fit of the model without such constraints. A model with several equality constraints across gender may be found to fit the data as well as a model without such constraints if only a few paths differ between men and women. Hence, as several constraints were freed up at the same time when comparing the fit of the constrained model to the unconstrained saturated model, modification indices were also checked to see if freeing up individual equality constraints would improve model fit. According to the principle of parsimony, a model should not contain more parameters than necessary for explaining associations between variables (Kline 2011). Hence, a constrained model should be preferred over an unconstrained model unless the latter shows better fit than the former. If the unconstrained model showed significantly better fit than the constrained model, the assumption of no gender differences should be rejected.

2.3.3 Does LS Predict Change in Relationship Quality to the Same Degree as Relationship Quality Predicts Change in LS?

The notion that LS predicts change in relationship quality to the same degree as relationship quality predicts change in LS was then formally tested. This was done by imposing equality constraints across direction on the longitudinal paths between each partner's LS and the same partner's evaluation of relationship quality (setting paths a = paths b in Fig. 1). The fit of the model with these constraints was compared to the fit of the previous model. If imposing these constraints would lead to significantly deterioration of model fit, the notion of equality across direction in longitudinal paths between LS and relationship quality should be rejected.

Descriptive statistics and correlations were performed with SPSS Version 20, while structural equation modelling was performed in Mplus Version 7 (Muthén and Muthén 2010). For analyses in Mplus, the Robust Maximum Likelihood (MLR) estimator was used due to relatively high skewness in several of the main variables. This estimator allows using all available information (Full Information Maximum Likelihood, FIML) and is the preferred estimator in situations where the MCAR assumption is not satisfied. However, Chi square values obtained from the MLR-estimator can not be used for Chi square difference testing of nested models because the differences between them are not Chi square distributed. Comparison of model fit was therefore performed with adjusted $\Delta\chi^2$—values as suggested by Satorra and Bentler (2001).

3 Results

3.1 Descriptive Statistics

Means and standard deviations for the main study variables are reported in Table 1. Men and women showed LS-scores in the range 'satisfied' as defined by Pavot and Diener (1993), which is in line with previous findings of LS levels in Western countries (Pavot and Diener 2008). Relationship quality-scores were also in the upper range of the scale, and there were no gender differences in LS or relationship quality in 2008. In 2011, women showed significantly lower relationship quality-scores than men. Mean reported level of stress related to own physical health was relatively low ($M_{men} = 1.37$, $SD_{men} = 0.63$;

Table 1 Means and standard deviations (SD) of the main study variables

	Men		Women	
	Mean	SD	Mean	SD
LS 2008 (scale 1–7)	5.43	0.98	5.48	1.13
RQ 2008 (scale 1–5)	4.17	0.78	4.06	0.78
LS 2011 (scale 1–7)	5.47	1.05	5.41	1.07
RQ 2011 (scale 1–5)	4.22**	0.75	4.03**	0.78

LS life satisfaction, *RQ* relationship quality

** Significant ($p < .01$) difference between men and women. There were no significant changes ($p > .05$) in LS or RQ from 2008 to 2011

$M_{women} = 1.57$, $SD_{women} = 0.80$; scale 1–4). The mean score of problems related to children was 1.35 for both men and women ($SD_{men} = 0.44$ and $SD_{women} = .47$; scale 1–4), while the mean value of the family financial situation was 3.68 ($SD = 0.48$; scale 1–4). Further, the sample consisted of middle-aged persons with relatively high educational level. The majority of the sample had education from university/college (58.4 % of the women and 59.1 % of the men), and mean age in 2008 was 46 years among women and 48 years among men.

3.2 Correlations

Correlations between the study variables are shown in Table 2. One partner's LS in 2008 correlated significantly with both his or her own and the other partner's concurrent evaluation of relationship quality as well as with his or her own and the partner's evaluation of relationship quality in 2011. One partner's evaluation of relationship quality in 2008 also correlated significantly with his or her own and the other partner's LS in 2011.

3.3 The Structural Model

3.3.1 Comparison of Model Fit

The fit of the model with equality constraints across gender on the 8 longitudinal paths involving LS and relationship quality was not significantly poorer than the fit of the saturated model without such constraints ($\Delta\chi^2 = 2.36, \Delta df = 8, p > .05$). Modification indices did not suggest relaxation of any of the equality constraints across gender. Hence, the results did not suggest gender differences in the longitudinal paths involving LS and relationship quality. The fit of the model with equality constraints across gender was good ($\chi^2 = 2.36$, df = 8, $p > .05$, CFI = 1.00, TLI = 1.07, RMSEA = 0.000, 90 % CI 0.000–0.000).

One further model comparison was then performed to formally test whether LS predicted change in relationship quality to the same degree as relationship quality predicted change in LS. The fit of a model with equality constraints across direction on the longitudinal paths between LS and relationship quality (paths a = paths b in Fig. 1) was compared to the fit of the previous model without these constraints. Because all longitudinal associations between LS and relationship quality were already constrained to be equal across gender, these additional constraints across direction only led to one extra df. The results showed that the model with equality constraints across direction on the longitudinal paths between LS and relationship quality did not fit the data significantly worse than the previous model without these constraints ($\Delta\chi^2 = 0.31, \Delta df = 1, p > .05$). The final model thus included equality constraints across gender on all longitudinal paths involving LS and relationship quality and also equality constraints across direction on the longitudinal paths between each partner's LS and the same partner's evaluation of relationship quality. The fit of this final model was good ($\chi^2 = 2.67$, $df = 9$, $p > .05$, CFI = 1.00, TLI = 1.07, RMSEA = 0.000, 90 % CI 0.000–0.000).

3.3.2 Overall Findings of Longitudinal Associations Between LS and Relationship Quality

The structural model (see Fig. 2) supported the notion that evaluation of relationship quality predicted change in LS (aim 1). This was shown by the statistically significant

Table 2 Pearson's correlations between study variables in 2008 and 2011

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2008															
1. LS m															
2. LS w	.44**														
3. RQ m	.40***	.34**													
4. RQ w	.39***	.52**	.54**												
2011															
5. LS m	.71**	.43**	.36**	.32**											
6. LS w	.41**	.67**	.25**	.48**	.39**										
7. RQ m	.45**	.41**	.64**	.49**	.57**	.39**									
8. RQ w	.39**	.54**	.43**	.73**	.34**	.60**	.61**								
Control variables															
9. Heath m	−.15*	−.17*	−.05	−.07	−.06	−.12	−.14	−.05							
10. Health w	−.16*	−.25**	−.04	−.12	−.15*	−.22**	−.07	−.13	.02						
11. Edu m	.12	.21**	−.13	−.02	.10	.17*	−.16*	.01	−.08	−.05					
12. Edu w	.07	.11	−.15*	−.06	.07	.14*	−.11	−.07	−.12	−.12	.63**				
13. Age m	−.12	−.05	.04	−.05	−.18*	−.09	−.10	−.05	.01	.12	.15*	.03			
14. Age w	−.12	.01	.01	−.04	−.16*	−.01	−.08	.01	−.03	.03	.18**	.10	.74**		
15. Finances	.23**	.34***	.12	.13	.23**	.29**	.07	.14*	−.11	−.19**	.29**	.27**	−.08	.01	
16. Child stress	−.14	−.29**	−.11	−.15*	−.12	−.16*	−.12	−.15*	.13	.15*	−.01	−.04	.06	−.07	−.06

LS = life satisfaction, RQ = relationship quality, Health = physical health problems, Edu = educational level, Finances = family's financial situation, Child stress = family stress related to children, m = men, w = women

* $p < .05$; ** $p < .01$
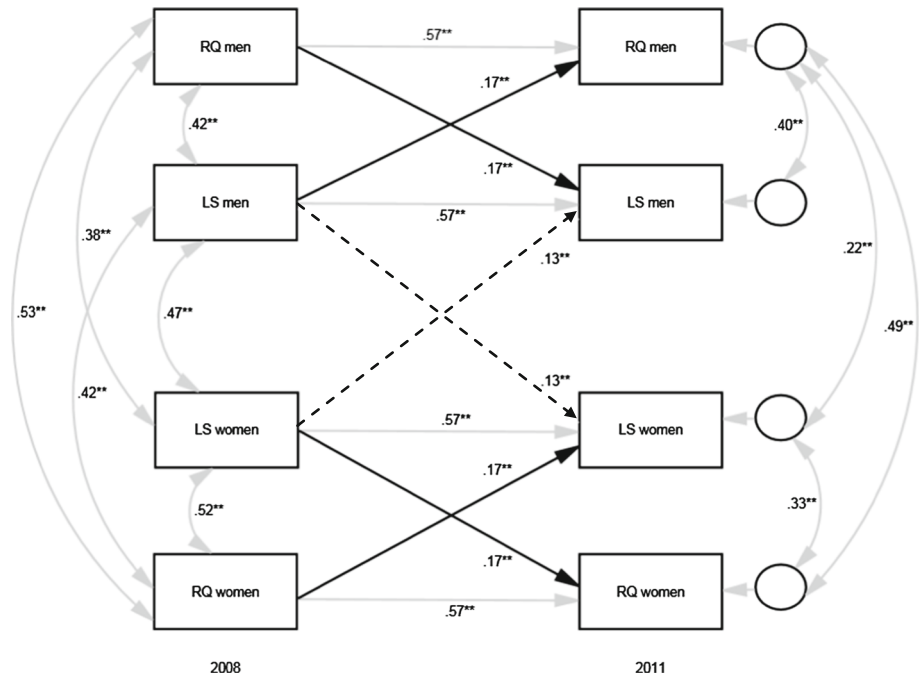
Fig. 2 The structural model showing longitudinal associations between LS and RQ. *Notes*: **p < .01. *LS* life satisfaction, *RQ* relationship quality. Paths between all variables were allowed, but only statistically significant (p < .05) paths are shown in the figure. Parameters are standardized. The paths represented by *black solid arrows* support the research questions in aim 1 regarding bi-directional longitudinal associations between LS and relationship quality. The paths represented by *black dotted arrows* support the first research question in aim 2 regarding longitudinal associations between the two partners' LS. There were no significant longitudinal associations between two partners' evaluation of relationship quality (p > .05), thus not supporting the second part of aim 2. *Grey arrows* represent statistically significant paths that did not correspond directly to the aims, but were allowed in the model to control for alternative associations when examining the associations specified in the aims. The model was adjusted for age, educational level, both partners' health complaints, child related problems, and the family's financial situation. To reduce complexity, these covariates are not drawn in the figure

paths from each partner's baseline evaluation of relationship quality to the same partner's follow-up LS, controlled for baseline LS (black solid arrows in Fig. 2). The results also supported the notion that LS predicted change in evaluation of relationship quality (also aim 1). This was shown by the statistically significant paths from each partner's baseline LS to the same partner's follow-up evaluation of relationship quality, controlled for baseline evaluation of relationship quality (also black solid arrows in Fig. 2). The model further supported the notion that one partner's baseline LS predicted change in the other partner's LS over time (first part of aim 2). This was shown by the statistically significant paths from each partner's baseline LS to the other partner's follow-up LS, controlled for this second partner's baseline LS (black dotted arrows in Fig. 2). However, the model did not support the notion that one partner's baseline evaluation of relationship quality predicted change in the other partner's evaluation of relationship quality (second part of aim 2).

3.3.3 Magnitude of the Longitudinal Associations

The magnitude of the association between baseline LS and change in evaluation of relationship quality was $\beta = .17$ ($p < .01$). The magnitude of the path in the opposite direction (from baseline evaluation of relationship quality to change in LS) was also $\beta = .17$ ($p < .01$) as these paths were constrained to be equal. Further, as these associations were also constrained to be equal across gender, these results were the same for men and women. The magnitude of the associations from one partner's baseline LS to change in the other partner's LS was $\beta = .13$, $p < .01$. Again, this effect was set to be equal for men and women. All effect sizes were adjusted for both partners' baseline LS and evaluation of relationship quality and also for the covariates as discussed above. The results showed that none of the covariates predicted change in LS or evaluation of relationship quality for men or women (all $p > .05$). To reduce complexity, the covariates are not drawn in Fig. 2.

4 Discussion

The main aim of the current study was to examine the longitudinal associations between LS and relationship quality among persons involved in long-term relationships. The results showed that LS and relationship quality predicted change in each other. Further, one partner's LS at one time point predicted change in the other partner's LS, even when adjusting for several possible confounders and both partners' evaluation of relationship quality. One partner's evaluation of relationship quality did not predict change in the other partner's evaluation of relationship quality. Thus, there was support for the notion that one partner's LS affected the other partner's LS, but not for the notion that one partner's evaluation of relationship quality affected the other partner's evaluation of relationship quality. There were no gender differences in the results. The findings are discussed more thoroughly below.

4.1 Aim 1: Longitudinal Associations Between LS and Relationship Quality

The current results showed cross-lagged effects between relationship quality and LS. These findings support previous studies reporting that relationship quality and LS predict change in each other (Dyrdal et al. 2011; Headey et al. 1991). This is also in line with Ruvolo's (1998) finding that relationship quality and affective well-being predicted change in each other. Hence, the current findings and the findings of Dyrdal et al. (2011), Headey et al. (1991), and Ruvolo (1998) together suggest that relationship quality is important for cognitive as well as affective aspects of subjective well-being and that both of these aspects of subjective well-being are important for relationship quality.

Dyrdal et al. (2011) showed that among pregnant women and women with new-born children, relationship quality predicted change in LS to a stronger degree than LS predicted change in relationship quality. The authors hypothesized that this could be due to pregnancy and infancy being a time where the relationship to the partner is particularly salient for LS (Dyrdal et al. 2011). The current findings of similar effects from LS to relationship quality as from relationship quality to LS among older couples support that interpretation. Seen together, the findings of Dyrdal et al. (2011) and the findings of the current study suggest that the relative importance of LS for relationship quality versus the importance of relationship quality for LS vary somewhat over the life course. The mean age of women in

Dyrdal et al. (2011) study was about 30 years, and nearly half of the women were expecting their first child. Our study shows that among considerably older men and women (mean age 46 among women and 48 among men) in long-lasting relationships with teenaged children, relationship quality and LS still predict change in each other. This suggests that the effect of LS on relationship quality and the effect of relationship quality on LS continue even after many years in the same relationship. These findings may imply that, even among "older" couples, good relationship quality can increase LS, and also that relationship quality can be increased by high LS.

4.2 Aim 2: Does One Partner's LS Predict Change in the Other Partner's LS?

The current study showed an association between one partner's level of LS at baseline and change in the other partner's LS from baseline to follow-up. This means that the higher one partner's baseline LS was, the more the other partner's LS increased from baseline to follow-up. There are several different possible explanations for this finding. First, the other partner's LS may be an important domain when a person considers how satisfied he or she is with his or her own life. Seeing a loved person suffering or being generally dissatisfied with life, may be painful and may affect the degree to which a person is satisfied with his or her own life as a whole. Likewise, seeing a loved person enjoying life, may contribute to high levels of LS.

Another possible explanation for this association is that partners affect each other's way of interpreting the world. LS is a cognitive evaluation (Diener 1984) of how satisfied a person is with his or her life as a whole, and therefore reflects objective life circumstances as well as the person's perception and interpretation of these circumstances. A possible explanation for the current findings is therefore that a person's evaluation of LS is influenced by how the other partner evaluates life. Previous findings have shown that people often use information about how others interpret a situation when making their own interpretation of the same situation. This has been shown to apply to ratings of severity of physical pain, perception of physical surroundings, perception of risk, and evaluations of the severity of an emergency (see Cialdini 1993; Fiske and Taylor 1991; Gleitman 1995; Plous 1993; Turner 1991 for thorough reviews of this literature). According to Social identity theory "all knowledge is socially derived" (Hogg and Abrams 1988, p. 22) and people strive to "see the world in the same way as do other ingroup members" (Hogg and Abrams 1988, p. 22). The current findings may be interpreted to support the notion that such theories also apply to LS judgments.

Regardless of which of the two interpretations above is most correct, the current findings suggest that similarity in LS among partners to some extent is due to one partner's LS being important for the other partner's LS. Our results suggest that LS is not only a private affair, but may have consequences for an intimate partner as well. This is in line with findings from a previous study reporting that persons who belonged to a network of people with high degrees of affective well-being had higher chances of experiencing increased affective well-being themselves, compared to people who belonged to networks of people with lower levels of affective well-being (Fowler and Christakis 2009). Affect has previously been found to be contagious between people (Howes et al. 1985), which may explain Fowler and Christakis' (2009) findings. Our findings suggest that LS, which is a cognitive rather than an affective measure of subjective well-being, may also be contagious from one person to another. The current study and Fowler and Christakis' (2009)

study together suggest that both LS and affective well-being may spread from one person to another.

Further, the current results showed that one partner's LS level more than 15 years after the beginning of a relationship predicted further change in the other partner's LS. Stable components of a persons's LS may be suspected to have their effect on the other partner in the beginning of a relationship. However, LS changes over time (Diener et al. 2013), and the current results suggest that even after many years together, one person's level of LS may be important for subsequent change in the other partner's LS.

In the current study, the correlation between two partners' LS did not increase over time even though one partner's LS predicted change in the other partner's LS. This lack of increased similarity in LS over time is in accordance with previous findings of very stable similarity in LS among spouses (Tambs and Moum 1992). Our findings therefore suggest that as the partners influence each other's LS towards convergence, concurrent other processes that lead to decreasing similarity (such as for example environmental effects that only one of the partners are exposed to) are also taking place. One previous study has reported that the average partner similarity in mental health was quite stable over time (Gerstorf et al. 2013), and the current study suggests that this is also the case for LS.

The results from this study showed that one partner's evaluation of relationship quality did not predict change in the other partner's evaluation of relationship quality. This is in contrast to Ruvolo's findings (1998). Ruvolo (1998) used the same design as in our study (i.e. data from two time-points and a cross-lagged model) to examine the degree to which one partner's evaluation of relationship quality at one time point predicted change in the other partner's evaluation of relationship quality. One of the differences between that study and ours was the use of a sample of young couples (mean age about 25 years), in contrast to our sample of persons who had been in the same relationship for more than 15 years. Differences in the results may therefore suggest that unlike LS, evaluation of relationship quality is more 'contagious' between young partners compared to older partners in long-lasting relationships.

Another possible explanation of the different findings is that Ruvolo (1998) used a measure consisting of several aspects of relationship quality, such as one item regarding overall relationship satisfaction, one question about how certain the respondent was that he or she would still be married to the partner in 5 years, and an overall evaluation of relationship stability. The current study used a measure consisting only of items regarding relationship satisfaction. The different results may thus be due to the fact that the two studies did not examine exactly the same phenomenon. Whisman and Uebelacker (2009) reported weak longitudinal associations between two partners' evaluation of relationship quality in a sample of middle-aged and older adults. They used the same design as has been used in the current and Ruvolo's study (1998)—data from two time-points and a structural equation model. However, they used a measure of relationship quality that consisted of three items concerning supportive interactions between the spouses and three items concerning unsupportive interactions. That finding supports the interpretation that the degree to which one partner's evaluation of relationship quality predicts change in the other partner's evaluation of relationship quality among persons in established relationships, may depend upon the relationship quality measure used in a study.

4.3 Gender Differences

There were no gender differences in the longitudinal associations between relationship quality and LS. This is in line with previous research on longitudinal associations between

relationship quality and other measures, such as LS, anxiety, and depression (Proulx et al. 2007; Beach et al. 2003; Kouros et al. 2008; Whisman and Uebelacker 2009; Headey et al. 1991). This is also in line with Ruvolo's (1998) finding of no significant difference between men and women in the longitudinal associations between relationship quality and affective well-being. The current results suggest that in today's Western society, relationship quality is equally important for the LS of both women and men. Together with previous studies (Proulx et al. 2007; Headey et al. 1991; Ruvolo's 1998), the current study suggests that this is true for several aspects of subjective well-being.

Further, there were no gender differences in the longitudinal associations between one partner's LS and change in the other partner's LS. This suggests that the effect of one partner's LS on the other partner's LS is the same for men and women, at least among persons in long-lasting relationships.

4.4 Limitations

The current study has several strengths including being longitudinal and capturing information from both men and women. Nevertheless, some limitations need to be mentioned. First, the relatively high attrition rate since the main study started in 1993 may have reduced generalizability of the findings. However, educational level, which predicted attrition, was included in the model. A thorough analysis of attrition from the TOPP-study showed that correlations between variables in 1993 were the same among those who still participated in the study in 2008 as among those who had dropped out of the study (Gustavson et al. 2012b). Further, Monte Carlo simulations showed that estimates of associations between variables are generally quite robust against selective attrition, even when attrition is dependent upon unobserved variables (Gustavson et al. 2012b). This has recently been shown to also apply to more complex models of prediction of change (Gustavson and Borren 2014).

Second, we were only able to use two waves of data because the LS measure was not included in the questionnaires before 2008. More studies with three or more waves of data are needed to further examine how change in one partner's LS predicts change in the other partner's LS. Third, the relatively long follow-up period (3 years) may have led to weaker effects than what would have been identified with a shorter time span between two measurement points. Fourth, men's and women's physical health complaints were measured with only one question. Further studies are needed to examine the role of such complaints in the longitudinal associations between two partners' LS using multi-item measures with possibly higher reliability. Fifth, further studies are needed to examine the degree to which the current results also apply to younger couples. Gender roles develop gradually in a society and the importance of the partner's LS thus needs to be studied using recent data from persons of different ages. Sixth, the current method of sample selection might have influenced the results, as women were gatekeepers for men's participation. As discussed in the Sect. 2, women with responding partners on average evaluated their relationship as being of higher quality than women with non-responding partners. Hence, men's participation was a function of women's evaluation of relationship quality. The current study therefore used a data analytic estimator that accounted for the dependency between women's evaluation of relationship quality and men's participation. Nevertheless, further studies on the importance of one partner's LS for the other partner's LS would benefit from inviting both partners to the study separately. Seventh, as described in the Sect. 2, three outliers were removed from the analyses. This was done to prevent the results from being unduly affected by a few individuals. Nevertheless, outliers may represent an

important minority in the population, and the decision to remove them could have led to biased results. Further studies are needed with better coverage of couples with lower levels of LS and relationship quality included in the sample to examine the degree to which the current results also apply to these couples.

Eight, as discussed in the introduction, one alternative explanation for the association between one partner's LS and change in the other partner's LS is that shared life circumstances affect the two partners at different times. The current study cannot conclude about causality. If one partner's LS is affected first and then the other partner's LS is affected later, a spurious association between one partner's LS and change in the other partner's LS will appear. However, the model was controlled for life-stage relevant stressors such as own and partner's health problems, problems related to children, and the family's financial situation. Several other life events could affect one partner's LS first and then the other partner's LS, and it is not possible to control for all potential confounders. However, for a confounder to create a spurious association between women's LS and change in men's LS, the particular confounder would have to systematically affect women before men, and vice versa for a confounder to create a spurious association between men's LS and change in women's LS. Previous research findings suggest that couples' shared environmental factors do not tend to affect men's and women's LS in this way. Schimmack and Lucas (2010) concluded from their 21-year follow-up study that environmental factors affect husbands' and wives' LS in the same way. Their findings therefore do not suggest that shared life circumstances systematically affect one partner first and then the other partner in a way that would result in spurious associations between one partner's LS and consecutive change in the other partner's LS. Ninth, there may be some confounding of LS and evaluation of relationship quality, as LS is the cognitive component of subjective well-being and we also measured the cognitive component of relationship quality. However, as both baseline LS and baseline evaluation of relationship quality are included in the model, the observed associations between each variable and change in the other is controlled for the potential overlap between the two constructs.

5 Conclusion

The results from the current study showed that high levels of LS predicted a positive development in relationship quality, and high levels of relationship quality predict a positive development in LS among men and women in established relationships. This may imply that high levels of LS can lead to increased relationship quality and that a high level of relationship quality can lead to increased LS, even among persons who have been in the same relationship for as much as 10–20 years. The results also showed that one partner's LS predicted change in the other partner's LS. This suggests that a person's LS is not only a private matter, but rather that one person's LS may have consequences for the partner's LS. Hence, further studies should use dyadic-level measures of LS to learn more about stability and change in couple-level LS.

The current results suggest that interventions aiming to prevent poor relationship quality may be beneficial for people's general well-being as well. The results may thus imply that relationship quality interventions could be an important topic for public health policy makers. Further, clinical practitioners may inform clients that their well-being could be important for relationship quality and also for their partner's well-being, thus ensuring the clients that there is no need to see individual well-being as opposed to couple-level well-being.

References

Beach, S. R. H., Katz, J., Kim, S., & Brody, G. H. (2003). Prospective effects of marital satisfaction on depressive symptoms in established marriages: A dyadic model. *Journal of Social and Personal Relationships, 20*, 355–371.

Cialdini, R. B. (1993). *Influence: Science and practice* (3rd ed.). New York: HarperCollins.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New Jersey: Lawrence Erlbaum Associates.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–575.

Diener, M., & Diener McGavran, M. B. (2008). What makes people happy? A developmenatl approach to the literature on family relationships and well-being. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 347–375). New York: Guilford.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71–75.

Diener, E., Gohm, C. L., Suh, E., & Oishi, S. (2000). Similarity of the relations between marital status and subjective well-being across cultures. *Journal of Cross-Cultural Psychology, 31*, 419–436.

Diener, E., Inglehart, R., & Tay, L. (2013). Theory and validity of life satisfaction scales. *Social Indicators Research*. doi:10.1007/s11205-012-0076-y.

Dyrdal, G. M., Røysamb, E., Nes, R. B., & Vittersø, J. (2011). Can a happy relationship predict a happy life? A population-based study of maternal well-being during the life transition of pregnancy, infancy, and toddlerhood. *Journal of Happiness Studies*. doi:10.1007/s10902-010-9238-2.

Dyrenforth, P. S., Kashy, D. A., Donnellan, M. B., & Lucas, R. E. (2010). Predicting relationship and life satisfaction from personality in nationally representative samples from three countries: The relative importance of actor, partner, and similarity effects. *Journal of Personality and Social Psychology, 99*(4), 690–702.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition* (2nd ed.). New York: McGraw-Hill.

Fowler, J. H., & Christakis, N. A. (2009). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham heart study. *British Medical Journal, 338*, 1–13.

Gerstorf, D., Windsor, T. D., Hoppmann, C. A., & Butterworth, P. (2013). Longitudinal change in spousal similarities in mental health: Between-couple and within-couple perspectives. *Psychology and Aging, 28*(2), 540–554.

Gleitman, H. (1995). *Psychology* (4th ed.). New York: W.W. Norton & Company.

Gustavson, K., & Borren, I. (2014). Bias in the study of prediction of change: A Monte Carlo simulation study of the effects of selective attrition and inappropriate modeling of regression toward the mean. *BMC Medical Research Methodology, 14*, 133.

Gustavson, K., Nilsen, W., Ørstavik, R., & Røysamb, E. (2013). Relationship quality, divorce, and well-being: Findings from a three-year longitudinal study. *Journal of Positive Psychology*. doi:10.1080/17439760.2013.858274.

Gustavson, K., Røysamb, E., von Soest, T., Helland, M. J., & Mathiesen, K. S. (2012a). Longitudinal associations between relationship problems, divorce, and life satisfaction: Findings from a 15-year population-based study. *Journal of Positive Psychology, 7*(3), 188–197.

Gustavson, K., von Soest, T., Karevold, E., & Røysamb, E. (2012b). Attrition and generalizability in longitudinal studies: Findings from a 15-year population-based study and a Monte Carlo simulation study. *BMC Public Health, 12*.

Hawkins, D. N., & Booth, A. (2005). Unhappily ever after: Effects of long-term, low-quality marriages on well-being. *Social Forces, 84*, 451–471.

Headey, B., & Veenhoven, R. (1989). Does happiness induce a rosy outlook? In R. Veenhoven (Ed.), *How harmfull is happiness? Consequences of enjoying life or not* (pp. 106–127). Rotterdam: Universitaire Pers.

Headey, B., Veenhoven, R., & Wearing, A. (1991). Top–down versus bottom–up theories of subjective well-being. *Social Indicators Research, 24*, 81–100.

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family, 50*, 93–98.

Hendrick, S. S. (2004). Close relationships research: A resource for couple and family therapists. *Journal of Marital and Family Therapy, 30*, 13–27.

Hilpert, P., Bodenmann, G., Nussbeck, F. W., & Bradbury, T. N. (2014). Improving personal happiness through couple intervention: A randomized controlled trial of a self-directed couple enhancement program. *Journal of Happiness Studies*. doi:10.1007/s10902-014-9591-7.

Hogg, M. A., & Abrams, D. (1988). *Social identifications*. London: Routledge.

Howes, M. J., Hokanson, J. E., & Loewenstein, D. A. (1985). Induction of depressive affect after prolonged exposure to a mildly depressed individual. *Journal of Personality and Social Psychology, 49*(4), 1110–1113.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.

Kesebir, P., & Diener, E. (2009). In pursuit of happiness: Empirical answers to philosophical questions. In E. Diener (Ed.), *The science of well-being, the collected work of Ed Diener* (pp. 59–74). Social indicators research series. New York: Springer.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford.

Kouros, C. D., Papp, L. M., & Cummings, E. M. (2008). Interrelations and moderators of longitudinal links between marital satisfaction and depressive symptoms among couples in established relationships. *Journal of Family Psychology, 22*, 667–677.

Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological Science, 16*, 945–950.

Lucas, R. E., & Diener, E. (2008). Personality and subjective well-being. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 795–814). New York: Guilford.

Lucas, R. E., & Diener, E. (2009). Personality and subjective well-being. In E. Diener (Ed.), *The science of well-being, the collected work of Ed Diener* (pp. 75–102). Social indicators research series. New York: Springer.

Mathiesen, K. S., Sanson, A., Stoolmiller, M., & Karevold, E. (2009). The nature and predictors of undercontrolled and internalizing problem trajectories across early childhood. *Journal of Abnormal Child Psychology, 37*(2), 209–222.

Muthén, L. K., & Muthén, B. O. (2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.

Neyer, F. J., & Lehnart, J. (2006). Personality, relationships, and health: A dynamic-transactional perspective. In M. E. Vollrath (Ed.), *Handbook of personality and health* (pp. 195–213). New York, NY: Wiley.

Oishi, S., & Koo, M. (2008). Two new questions about happiness. "Is happiness good?" and "Is happier better?". In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 290–322). New York: The Guilford Press.

Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5*, 164–172.

Pavot, W., & Diener, E. (2008). The Satisfaction with Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology, 3*, 137–152.

Plous, S. (1993). *The psychology of judgment and decision making*. New York: McGraw-Hill.

Proulx, C. M., Helms, H. M., & Buehler, C. (2007). Marital quality and personal well-being: A meta-analysis. *Journal of Marriage and Family*. doi:10.1111/j.1741-3737.2007.00393.x.

Røsand, G. M. B., Slinning, K., Eberhard-Gran, M., Røysamb, E., & Tambs, K. (2012). The buffering effect of relationship satisfaction on emotional distress in couples. *BMC Public Health, 12*.

Ruvolo, A. P. (1998). Marital well-being and general happiness of newlywed couples: Relationships across time. *Journal of Social and Personal Relationships*. doi:10.1177/0265407598154002.

Satorra, A., & Bentler, P. M. (2001). A scaled difference Chi square test statistic for moment structure analysis. *Psychometrika, 66*, 507–514.

Schimmack, U. (2008). The structure of subjective well-being. In M. Eid & R. J. Larsen (Eds.), *The science of subjective well-being* (pp. 97–123). New York: Guilford.

Schimmack, U., & Lucas, R. E. (2010). Environmental influences on well-being: A dyadic latent panel analysis of spousal similarity. *Social Indicators Research, 98*(1), 1–21.

Shek, D. T. L. (1995). Gender differences in marital quality and well-being in Chinese married adults. *Sex Roles*. doi:10.1007/BF01560185.

Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*(1), 15–28.

Tambs, K., & Moum, T. (1992). No large convergence during marriage for health, life-style, and personality in a large sample of Norwegian spouses. *Journal of Marriage and the Family, 54*(4), 957–971.

Turner, J. C. (1991). *Social influence*. Buckingham: Open University Press.

Vaughn, M. J., & Baier, M. E. M. (1999). Reliability and validity of the Relationship Assessment Scale. *American Journal of Family Therapy, 27*(2), 137–147.

Vittersø, J., Røysamb, E., & Diener, E. (2002). The concept of life satisfaction across cultures: Exploring its diverse meaning and relation to economic wealth. In E. Gullone & R. Cummins (Eds.), *Social indicators research book series: The universality of quality of life constructs* (pp. 81–103). New York: Kluver Academic Publishers.

Whisman, M. A., & Uebelacker, L. A. (2009). Prospective associations between marital discord and depressive symptoms in middle-aged and older adults. *Psychology and Aging, 24*, 184–189.