

A Longitudinal Examination of the Directional Effects between Relationship Quality and Well-Being for a National Sample of U.S. Men and Women

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Abstract The interaction between relationship quality and individual well-being has commonly been examined using a negative conceptualization of these constructs (e.g., relationship aggression and depression, respectively). The present study examines the direction of association between individual well-being and relationship quality. Specifically, we examined if this direction differed based on positive and negative conceptualizations of individual (i.e., life satisfaction and depression) and relationship (i.e., relationship satisfaction and conflict) well-being and how this differed for men and women. Using a series of cross-lagged path analyses across three time points, we found that relationship satisfaction and life satisfaction were mutually influential over time, but life satisfaction was only predictive of later conflict. Further, depression predicted both later relationship conflict and relationship satisfaction. Regarding gender differences, life satisfaction and relationship satisfaction exhibited a cyclical relationship for men but not for women. For women, but not men, depression was related to later relationship satisfaction. Taken together, these results suggest that nuances exist in the association

between relationship quality and individual well-being depending on the conceptualization of the construct (negative vs. positive) and gender. More specifically, it appears that life satisfaction, or positive conceptualizations of well-being, may be more relevant to men's relationship quality whereas depression, or negative conceptualizations of well-being, may be more relevant to women's relationship quality. Clinical implications and directions for future research are discussed.

Keywords Well-being · Relationship quality · Relationship satisfaction · Life satisfaction · Depression · Human sex differences

Married individuals generally fare better in terms of mental and physical health compared to non-married individuals (Proulx et al. 2007). However, a great deal of variation exists among married individuals, with some faring better than others. Two major points of variation among married individuals are (1) the quality of their romantic relationship and (2) gender. In general, men and women in low quality relationships report poorer well-being outcomes compared to those who are single or married (Umberson et al. 1996). Different aspects of relationship quality (e.g., stability, support, strain) may influence men's and women's well-being differently (Simon and Barrett 2010).

Romantic relationship quality and individual well-being appear to be related; however, questions remain regarding the direction of this association for positive or negative conceptualizations of these constructs and if this direction is the same for men and women. Scholars have examined the effect of relationship quality and individual well-being in a single direction, typically the influence of relationship quality on individual well-being (Beach et al. 1985; O'Leary et al. 1990); however, there is debate as to the direction of this relationship (Fincham and Beach 1999;

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Kurdek 1999). Furthermore, most studies have examined individual well-being in terms of depression, but it may also be important to consider positive indicators of individual well-being (e.g., life satisfaction) because such indicators may interact differently with characteristics of relationship quality (Pateraki and Roussi 2013). Although some may argue that low levels of depression may indicate positive well-being, we argue that the absence of depression is not equivalent to positive well-being and that alternative constructs of well-being may be more appropriate (Fincham and Beach 2010). Finally, regarding gender, much of the extant literature on gender differences in the association between relationship quality and mental health well-being have been mixed, with cross-sectional studies more often reporting gender differences than longitudinal designs (Proulx et al. 2009; Whisman 2001). Given these mixed findings, it remains important to consider the role of gender as a moderator when examining the directionality of the individual well-being and relationship quality interaction, to create a clearer depiction of the interplay of individual and relational health.

When understanding the interaction between individual well-being and relational quality there are two prominent models in marriage research: the stress generation model (Davila et al. 1997; Hammen 2006) and the marital discord model (Beach et al. 1990). Although these two models are similar, they predict different causal directions and differ in the role of gender in the model, and neither hypothesizes the role of positive constructs. Using these two models as a guide, we examined (a) how positive and negative conceptualizations of individual well-being and relationship quality influence each other over time and (b) whether longitudinal associations are moderated by gender, and if so, how.

The Stress Generation Model

The stress generation model (Hammen 2006) posits that spouses, with individual vulnerabilities and in low quality relationships, experience depressive symptoms as a result of stressful interactions with their spouse, which leads to more relational stress and subsequent worsening of depressive symptoms over time (Davila et al. 1997; Hammen 2006). Similarly, however, spouses, with the same individual vulnerabilities and in high quality relationships, can be protected against future depressive symptoms and life stress. The stress-generating process appears to be a bidirectional influence between marital quality and depression, or a feedback loop (Fincham et al. 1997). Marital quality serving as a buffer to depressive symptoms, despite individual vulnerabilities, points to the importance of conceptualizing both positive and negative aspects of relationship quality and individual well-being to gain a more complete understanding of the bidirectional relationship between marital quality and depression.

Interestingly, this model originally did not consider the role of gender. However, when examining this association in gender-separated models, women's reports of marital stress and depression mutually predicted the same variables at a later point, yet the cross influence of marital quality and depression did not hold for men (Davila et al. 1997). Similarly, Dehle and Weiss (1998) found that depression and marital quality were mutually influential over time for women, whereas for men, depression was negatively associated with marital quality in a single direction. Thus, within the stress generation model, it appears that the bidirectional association between depression and marital quality over time may be moderated by gender.

The Marital Discord Model

The marital discord model (Beach et al. 1990) suggests that low marital quality precedes psychological distress. More specifically, low marital quality leads to depressive symptoms through the removal of resources such as spousal support, an increase in spousal stress, and an increase in hostility experienced in the marriage (Beach et al. 1990). Further, marital dissatisfaction decreases positive marital characteristics such as intimacy, dependency, and couple-cohesion while increasing negative marital characteristics such as aggression, criticism, and blame (Beach et al. 1990). Empirical support for this theoretical model is much stronger than for the stress generation model, with scholars finding that (a) marital dissatisfaction was related to episodes of major depression and depressive symptoms (Beach 2001), (b) positive marital events were associated with decreased depression (Brown et al. 1992), (c) marital quality influenced depression when controlling for initial depressive symptoms (Beach and O'Leary, 1993), and (d) clinically treating individuals' depressive symptoms did not improve later marital quality (Foley et al. 1989). However, in a sample of women, relationship satisfaction was found to have a weak causal relationship with depression at a 12-week-follow-up, which indicates that, among women, the relationship between marital quality and individual well-being may not be as strong as originally suggested (Burns et al. 1994). Although this theory has empirical support in both clinical and community populations, it was developed to help clinicians reduce depression among married individuals. Therefore, this theory may not hold when examining both positive and negative conceptualizations of marital quality and individual well-being among a non-clinical sample.

When examining these models together, one can see that mixed findings remain regarding the directional relationship between marital distress and depressive symptoms, as well as with gender. Beach and O'Leary (1993) found that global relationship adjustment predicted later depression symptoms for both men and women; however, the interaction between gender and marital quality was not related to depression.

More recently, Gabriel et al. (2010) found that how an individual interacts with his or her partner depends on gender, depression, and marital distress, indicating that the association between marital quality and depression may be more complex than originally thought and that gender, along with multiple aspects of relationships, must be considered when examining the association between interpersonal and intrapersonal variables.

The Role of Gender

Although both men and women report greater depressive symptoms when involved in a low-quality romantic relationship (Whisman 2007; Whisman et al. 2000), a gender difference exists regarding the severity of various depressive symptoms. Men tend to report more dysthymic symptoms (a long-term and continuous report of moderately depressed affect) and women tend to report an episode of major depression (a single incidence of three of the five symptoms of major depression). This disparity in gender presentations of depression may suggest that low marital quality influences men's affect over an extended period of time, but with less severe symptoms, whereas women may experience more acute, yet severe symptoms.

In terms of the directional link between relationship quality and individual well-being, there is evidence that the directionality may also differ by gender. For example, Fincham et al. (1997) found that depression negatively affected a husband's marital satisfaction whereas the opposite was true for women (i.e. marital satisfaction exacerbated a wife's depression). Kurdek (1998), although unable to perfectly replicate Fincham and colleagues' (1997) findings, concluded that marital quality was linked to depression symptoms for men whereas depression symptoms were not linked to marital quality for women. In a re-analysis, Kurdek (1999) reported that marital quality influenced depression for both husbands and wives, but there were no gender differences.

Taken together, there are inconsistencies regarding the directionality of marital quality and individual well-being and whether the direction of influence differs by gender. Inconsistency may be attributed to: (a) not measuring both positive and negative aspects of relationship quality, (b) not measuring positive and negative aspects of individual well-being, and/or (c) only examining change across short periods of time.

In the present study, we address these limitations by examining both positive and negative aspects of relationship quality and individual well-being across three time points using a cross-lagged path analysis to address two research questions. First, what is the mutual influence of positive and negative dimensions of relationship quality (i.e., relationship satisfaction and conflict, respectively) and individual well-being (i.e.,

life satisfaction and depression, respectively) across three time points? Second, does gender moderate the mutual influence of positive and negative dimensions of relationship quality (i.e., relationship satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression) across three time points, and if so how?

Method

Procedures

The present study used data collected by the Americans' Changing Lives (ACL) project (House 2014) which consists of five waves of survey data over a 25-year period: Wave 1 (W1) collected in 1986; Wave 2 (W2), in 1989; Wave 3 (W3), in 1994; Wave 4 (W4), in 2002; and Wave 5 (W5), in 2011. Only W1, W3, and W5 were used for our study to more parsimoniously examine mediation over this lengthy time period. A cross-lagged model using all five waves of data was tested; however, the three wave model was a more parsimonious examination of mediation over time. Additionally, the number of waves examined was reduced so that there would be enough statistical power to properly estimate the model. The ACL data are part of a larger project that examines how activities and social relationships influence individual productivity and how individuals adapt to stress and life events that could influence individual health and effective functioning. Data were collected through face-to-face survey interviews by trained interviewers. House (2014) study website provides a detailed description of collection methodology.

Participants

The participants from W1 of the ACL were sampled using a multistage stratified sampling of individuals ages 25 or older within the continental United States ($N = 3617$). African Americans and individuals over age 60 were oversampled at W1 so that those proportions in this sample are greater than the national average. For all subsequent waves, an attempt was made to contact all respondents from previous waves: W3 = 2559 and W5 = 1313. Most attrition was due to participant mortality rather than nonresponse. At W5, 46.3% of participants were considered "missing deceased" and 17.4% were considered "missing: nonresponders." Missing: deceased status was determined by the interviewer verifying this status with family members. Inclusion criteria for the present study limited participants to those who reported being married or in a romantic relationship at W1, removing 42.9% of participants from the overall sample. The final study sample included 2066 respondents in W1, 1586 in W3, and 1125 in W5.

At W1, 2066 individuals participated in the study (Men: $n = 736$, 35.6%; Women: $n = 957$, 46.3%) with the

majority reporting as White ($n = 1493$, 72.3%), followed by Black ($n = 497$, 24.1%), Native American ($n = 32$, 1.5%), Asian ($n = 24$, 1.2%), and Hispanic ($n = 20$, 1.0%). At W1, participants were on average 51.83 years-old ($SD = 16.34$, range = 25–92 years). Participants were married or partnered for an average of 27.46 years ($SD = 16.77$, range = <1–67 years). Participants who reported being married ranged from 29.0% ($n = 599$) to 95.6% ($n = 1976$) across the three waves. Those who reported being divorced ranged from 1.4% ($n = 29$) to 4.9% ($n = 102$). Those who reported being widowed ranged from <1% ($n = 5$) to 10.4% ($n = 215$). On average, one child lived in the household, and the number of children ranged from 0 to 8 children across all waves of data collection. See Table 1 for sample demographics across the three waves of data.

Measures

It is important to note that relationship satisfaction, conflict, and life satisfaction were assessed using one-item measures. Due to the length of the survey, many constructs were assessed using one-item measures to reduce participants' fatigue. Although this assessment is not always preferred, research examining the predictive validity of a multiple-item measure versus single-item measure found no significant differences (Bergkvist and Rossiter 2007). Furthermore, this type of assessment is a common practice with these many-question and large-sample datasets (e.g., Moazen-Zadeh and Assari 2016). The means for each study variable across waves are reported in Table 1.

Relationship Quality Variables

Relationship satisfaction was the positive dimension of relationship quality examined in our study. This variable was measured by a single item: "Taking all things together, how satisfied are you with your marriage/relationship?" Response options ranged from 0 (*Completely satisfied*) to 4 (*Not at all satisfied*). The item was reverse coded so that higher scores indicated greater satisfaction.

The negative dimension of relationship quality, conflict, was measured using a single item: "How often would you say the two of you typically have unpleasant disagreements or conflicts?" Response options ranged from 0 (*Never*) to 6 (*Daily or almost daily*). If participants did not respond to this question or were divorced/widowed, these relationship quality variables were coded as missing.

Individual Well-Being Variables

Depression was the negative dimension of individual well-being and was measured using an 11-item scale based on the Center for Epidemiologic Studies Depression (CESD; Radloff

1977) scale. Response options to items (e.g., "I felt sad" and "I felt that people disliked me") ranged from 0 (*Never or hardly ever*) to 3 (*Most of the time*), with higher total scores indicating greater depression. Scale reliability was acceptable for each wave of the study (W1: $\alpha = .81$, W3: $\alpha = .83$, W5: $\alpha = .85$). Items were summed to create a single score where higher scores indicated greater depressed feelings.

Life satisfaction was the positive dimension of individual well-being. This variable was measured using a single item: "Now please think about your life as a whole. How satisfied are you with it?" Response options ranged from 0 (*Completely satisfied*) to 4 (*Not at all satisfied*). The items were reverse coded so that higher scores indicated greater life satisfaction.

To examine whether the means of study variables changed over time, repeated measures ANOVAs were conducted for the means of relationship satisfaction, conflict, life satisfaction, and depression at the three time points. A Bonferroni correction ($.05/4 = .0125$) was employed to ensure a more conservative observation of statistical significance due to the number of analyses that were run. Men's relationship satisfaction significantly differed across the three time points, Wilks' Lambda = .92, $F(2, 258) = 11.05$, $p < .001$, $\eta^2 = .08$. Pairwise comparisons revealed a significant ($p < .05$) decrease in relationship satisfaction ($p = .01$) from W1 to W3 and a significant increase in relationship satisfaction ($p < .05$) from W3 to W5. Women's relationship satisfaction did not significantly differ across the three time points, Wilks' Lambda = .98, $F(2, 239) = 2.78$, $p = .06$, $\eta^2 = .02$.

Men's conflict significantly differed across the three time points, Wilks' Lambda = .95, $F(2, 256) = 7.10$, $p = .001$, $\eta^2 = .05$. Pairwise comparisons revealed a significant decrease in conflict from W1 to W3 ($p < .05$) and a significant increase in conflict from W3 to W5 ($p < .01$). Women's conflict did not significantly differ across the three time points, Wilks' Lambda = .98, $F(2, 239) = 2.29$, $p = .10$, $\eta^2 = .02$.

Men's life satisfaction significantly differed across the three time points, Wilks' Lambda = .95, $F(2, 317) = 8.81$, $p < .001$, $\eta^2 = .05$. Pairwise comparisons revealed a significant decrease in life satisfaction from W3 to W5 ($p < .05$). Furthermore, men's life satisfaction at W5 was significantly lower than their life satisfaction at W1 ($p < .05$). Women's life satisfaction also significantly differed across the three time points, Wilks' Lambda = .98, $F(2, 423) = 4.73$, $p = .009$, $\eta^2 = .02$. Pairwise comparisons revealed a significant increase in life satisfaction from W1 to W3 ($p < .05$) and a significant decrease from W3 to W5 ($p < .05$).

Lastly, depression significantly differed across the three time points for men, Wilks' Lambda = .72, $F(2, 318) = 63.48$, $p < .001$, $\eta^2 = .29$, and for women, Wilks' Lambda = .66, $F(2, 424) = 109.88$, $p < .001$, $\eta^2 = .34$. Pairwise comparisons revealed a significant increase in depression from W1 to W3 ($p < .05$ for men and women) and from W3 to W5 ($p < .05$ for men and women).

Table 1 Sample demographics and gender differences in relationship quality and well-being

Variables	Wave 1 (<i>n</i> = 2066)		Wave 3 (<i>n</i> = 1586)		Wave 5 (<i>n</i> = 1125)	
	<i>n</i> or <i>M</i> (<i>SD</i>)	% or <i>M</i> (<i>SD</i>)	<i>n</i> or <i>M</i> (<i>SD</i>)	% or <i>M</i> (<i>SD</i>)	<i>n</i> or <i>M</i> (<i>SD</i>)	% or <i>M</i> (<i>SD</i>)
(a) Demographic information						
Gender						
Male	736	35.6%	--	--	--	--
Female	957	46.3%	--	--	--	--
Race						
White	1493	72.3%	--	--	--	--
Black	497	24.1%	--	--	--	--
Native American	32	1.5%	--	--	--	--
Asian	24	1.2%	--	--	--	--
Hispanic	20	1.0%	--	--	--	--
Marital status						
Married	1976	95.6%	1260	61.0%	599	29.0%
Separated	11	.5%	34	1.6%	12	.6%
Divorced	29	1.4%	98	4.7%	102	4.9%
Widowed	5	.2%	173	8.4%	215	10.4%
Never married	45	2.2%	21	1.0%	13	.6%
Missing	0	0%	480	23.2%	941	45.5%
Children in home						
0	1077	52.1%	910	44.0%	--	--
1	357	17.3%	271	13.1%	--	--
2	386	18.7%	247	12.0%	--	--
3	175	8.5%	115	5.6%	--	--
4	48	2.3%	27	1.3%	--	--
5 or more	23	1.0%	16	.07%	--	--
Missing deceased	--	--	235	11.4%	838	40.6%
Missing nonresponders	--	--	245	11.9%	363	17.6%
Age (years)	51.83(16.34)	--	--	--	--	--
Relationship length (Years)	27.46(16.77)	--	--	--	--	--
(b) Gender comparisons						
	Wave 1		Wave 3		Wave 5	
	Men	Women	Men	Women	Men	Women
Relationship quality variables						
Relationship satisfaction	3.37(.75)	3.22(.82)	3.29(.76)	3.16(.88)	3.40(.74)	1.13(.90)
Conflict	2.66(.99)	2.66(1.02)	2.47 (1.0)	2.44 (1.03)	2.65(.99)	2.45 (1.08)
Well-being variables						
Life satisfaction	1.16(.84)	1.09(.85)	1.28(.85)	1.26(.91)	1.14(.85)	1.13(.90)
Depression	5.13(3.48)	5.58(3.71)	5.56(3.27)	6.24(3.75)	6.93(3.35)	7.67(3.87)

Age ranged from 25 to 92 years-old; Relationship length from <1–67 years

Gender and Control Variables

Gender was used as a moderating variable and was coded as 0 for men and 1 for women. Gender was reported by the interviewer, not the participant. Control variables were included in the statistical models to help explain missingness and to control for the variance explained by the difference among these variables. *Relationship duration* was assessed at W1 to control for duration of the current relationship prior to the start of the

study. The variable was assessed using a single item: “For how many months or years have you been living with your partner?” Responses were coded so that units are in years and not months. *Total number of children in the home* was included in the model for every wave of data collection. Response options ranged from zero children (coded 0) to 8 or more children (8). *Age* (measured in years) was assessed at W1 to account for differences in relationship characteristics that might occur as a function of age (Levenson et al. 1993).

Finally, relationship status was measured at multiple waves of data collection. This status was determined from a single item: “Are you currently married, separated, divorced, widowed, never married?” This item was recoded into several dichotomous variables which pertained to our study: *Relationship type*—Married (coded 0); cohabiting (1) at W1 for all outcome variables, and to account for *relationship stability*, we included divorced (coded 1); All else (0) and widowed (coded 1); All else (0) at W3 and W5.

Analytical Strategy

The first research question of the present study was to determine the mutual influence of positive and negative dimensions of relationship quality (i.e., relationship satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression) across three time points. Cross-lagged panel correlation (CLPC) was used to determine the direction of the relationship between individual well-being and relationship quality. This analytic procedure simultaneously compares the correlation between individual well-being and relationship quality within each wave (synchronous correlation), the correlations between adjacent waves for individual well-being and relationship quality separately (autocorrelations), and correlations between individual well-being and relationship quality across waves (cross-lagged correlations). Assessing these relationships simultaneously is thought to determine the causal direction of these relationships across time (Locascio 1982; Mayer and Carroll 1987). For these models, the null hypothesis is that a third unmeasured variable is causing any observed statistically significant relationship; therefore, the CLPC is a critical technique for establishing directional causality because it controls for synchronous correlations and autocorrelation (Kenny 1975, 1979).

However, caution must be taken with the results of these models. For these models to be reliable, synchronous correlations should be at least .30, an adequate sample must be used, and there must be a theoretical base for the causal relationship (Kenny and Harackiewicz 1979). Bentler and Speckart (1981) discussed concerns with the original CLPC’s ability to determine a causal model, including model misspecification and measurement error. Therefore, caution must be used when interpreting a causal relationship because of the difficulty of including all of the plausible variables (misspecification) and the measurement error inherent in using single item measures. Further, due to our large sample size, we only interpret when there is at least a “small” effect (standardized beta \geq .10; Cohen 1992; Durlak 2009).

To assess model-data fit for the CLPC, the chi-square test, the standardized root mean square residual (SRMR), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and

the root mean square of error approximation (RMSEA) were evaluated. A model was determined to have good fit to the data if the chi-square was small and non-significant, the SRMR value was less than .10, the CFI and TLI values were greater than .95, and the RMSEA was less than .05 (Kenny 2005).

All analyses were conducted in Mplus using TYPE = COMPLEX. The TYPE = COMPLEX method takes into account stratification, clustering, and sampling weights, all of which were developed by the ACL (House 2014). This approach utilizes these sampling features to compute standard errors and chi-square tests of model-data fit. Because all outcome variables are continuous, maximum likelihood with robust standard errors (MLR) was used as the estimator. MLR is robust to non-normality and non-independence of observations (Asparouhov 2005). Mplus was also used to test mediation (to assess for a cyclical relationship among variables) across the three time points. Mplus uses the delta method to test for indirect effects. The delta method is similar to the Sobel test of mediation (MacKinnon 2008).

Grouping CLPC

The second research question of the present study was to examine how gender moderates the mutual influence of positive and negative dimensions of relationship quality (i.e., relationship satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression) across three time points. To do this, gender was examined regarding its influence on the direction of the relationship for CLPC models. To test the influence of gender, a categorical variable (i.e., gender) was assigned to be recognized as a grouping variable (“GROUPING option” in Mplus; Muthén and Muthén 1998–2012, p. 430). The grouping variable analyzes the model multiple times and constrains the coefficient paths to a different level of the grouping variable for each iteration. This method is preferred over running the model separate times with sub-samples of the data because the analysis provides an overall model-data fit for all iterations (Muthén and Muthén 1998–2012).

To determine if paths significantly differed by gender, each path in the model was constrained to be equal for men and women. Then, using the Satorra-Bentler chi-square difference test, comparisons of the freely estimated and constrained models were made. Specifically, by comparing the freely estimated and constrained models, a model is considered to fit the data better when each group takes on unique structural pathway estimates. If constraining the structural pathways to be equal reduces the overall model-data fit, this would suggest that the pathways differ for men and women. Therefore, a significant Satorra-Bentler chi-square test indicates that the tested path significantly differed by gender.

Results

Preliminary Analyses

Using Little's MCAR test, we were able to determine that the data were missing completely at random, $\chi^2(255) = 516.91$, $p < .001$. Therefore, the present use of full information maximum likelihood (FIML) is appropriate because it handles data missing at random when covariates are included. All analyses were conducted using Mplus 7.0 (Muthén and Muthén 1998–2012). Missing values were handled using full information maximum likelihood estimation (FIMLE), which assumes data are missing at random, and the missing auxiliary variable function (AUXILIARY = (m)x) is used to help explain patterns of missingness. When the covariates related to the missing pattern are included in the model, FIMLE produces less biased and more reliable parameter estimates compared to conventional methods (e.g., list-wise deletion, multiple imputation; Schafer and Graham 2002). Type of missing (i.e., missing: non-responders and missing: deceased) differed on key demographic variables (e.g., socioeconomic status, race/ethnicity, age). Therefore, these demographic variables were included in the model estimation. Furthermore, t -tests found that individuals who were missing: deceased were more likely to report lower relationship satisfaction, $t(2057) = 5.75$, $p < .001$, and greater conflict, $t(2057) = 3.18$, $p < .01$. These were handled using FIML within Mplus, which is a better way of handling missing variables when data are not missing at random.

The primary statistical assumption for path analysis is normal distributions because problems with dependence, multicollinearity, or equality of variance are handled by this statistical method. Variables that may have problematic distributions (> 1) are relationship satisfaction (skewness ranged from -1.02 to -1.21 and kurtosis ranged from $.79$ to 1.56 across the three waves) and depression (skewness ranged from 1.06 to 1.57 and kurtosis ranged from $.87$ to 2.85 across the three waves). Caution should be taken when interpreting these variables and the robust standard errors estimated in reduce biased estimate when data are not normally distributed. (See online supplement Table 1s for skewness and kurtosis for all study variables.)

A series of correlation analyses were conducted to assess the initial relationship between control variables and variables of interest (see Table 2). Correlations were grouped by study wave, and only control variables that were significantly related to the variables of interest were retained in the final analyses. Results of the correlation analyses ranged from $r = -.48$ to $.43$ across the three waves.

Cross-Lagged Panel Correlation (CLPC)

Life Satisfaction CLPC

To address the first research question of the present study and determine the mutual influence of relationship satisfaction, conflict, life satisfaction, and depression across three time points, two CLPCs were conducted. The first analysis, the life satisfaction CLPC, examined continuous measures of relationship satisfaction, conflict, and life satisfaction. The model fit was acceptable, $\chi^2(9) = 52.78$, $p = .53$, CFI = $.94$, TLI = $.83$, RMSEA = $.049$, 95% CI [$.037$, $.062$]. The significant standardized path weights are shown in Fig. 1. Life satisfaction positively predicted later life satisfaction and relationship satisfaction, and negatively predicted conflict at W3, but not W5. Similarly, conflict positively predicted later conflict, as well as negatively predicted later relationship satisfaction. Interestingly, conflict did not predict later life satisfaction, but rather life satisfaction (W1) predicted later conflict (W3). Lastly, relationship satisfaction positively predicted later life satisfaction and relationship satisfaction. Interestingly, relationship satisfaction did not predict later conflict, but rather conflict predicted later relationship satisfaction. Taken together, these results address our first research question by determining that life satisfaction is predictive of later conflict, not the inverse. Similarly, conflict is predictive of later relationship satisfaction, not the inverse.

Indirect paths from W1 variables to W5 variables with W3 variables as mediators were tested. Of the nine indirect paths tested, there were four cross-variable (i.e., variable at W1 predicting another variable at W5) significant indirect paths. Life satisfaction (W3) and relationship satisfaction (W3) mediated the relationship between relationship satisfaction (W1) and later life satisfaction (W5). Thus, it appears that relationship satisfaction (W1) fosters greater relationship and life satisfaction (W3), both of which contribute to greater life satisfaction (W5), acting in a positive reciprocal process. Similarly, conflict (W3) mediated the relationship between life satisfaction (W1) and later conflict (W5). Thus, it appears that life satisfaction (W1) can set a context for later conflict, which persists over time. Lastly, relationship satisfaction (W3) mediated the relationship between conflict (W1) and later relationship satisfaction (W5). Thus, it appears that conflict (W1) predicted later relationship satisfaction (Standardized path weights of the indirect paths can be seen in Table 2s of the online supplement).

Depression CLPC

The next model, the depression CLPC, examined the associations among relationship satisfaction, conflict, and depression across the same 25-year time period. The model fit the data best when W1 variables were controlled for on W3 and

Table 2 Correlations of study variables of interest at each wave of data by gender

Waves	Relationship satisfaction			Relationship conflict			Life satisfaction			Depression		
	Wave 1	Wave 3	Wave 5	Wave 1	Wave 3	Wave 5	Wave 1	Wave 3	Wave 5	Wave 1	Wave 3	Wave 5
Relationship satisfaction												
Wave 1	--	.52**	.37**	.38**	.25**	.16*	-.47**	-.31**	-.20**	-.24**	-.16**	-.14**
Wave 3	.49**	--	.55**	.27**	.36**	.32**	-.34**	-.55**	-.30**	-.33**	-.38**	-.25**
Wave 5	.36**	.42**	--	.22**	.24**	.43**	-.21**	-.29**	-.45**	-.18**	-.29**	-.31**
Relationship conflict												
Wave 1	.27**	.25**	.19**	--	.41**	.40**	-.22**	-.18**	-.13**	-.30**	-.21**	-.17**
Wave 3	.19**	.25**	.26**	.45**	--	.48**	-.22**	-.26**	-.19**	-.19**	-.26**	-.15**
Wave 5	.17**	.12	.39**	.43**	.50**	--	-.07	-.18**	-.23**	-.19**	-.18**	-.24**
Life satisfaction												
Wave 1	-.41**	-.29**	-.27**	-.15**	-.14**	-.12*	--	.34**	.21**	.39**	.23**	.21**
Wave 3	-.34**	-.39**	-.26**	-.21**	-.20**	-.10	.39**	--	.34**	.27**	.41**	.23**
Wave 5	-.25**	-.26**	-.48**	-.18**	-.19**	-.26**	.30**	.33**	--	.27**	.25**	.46**
Depression												
Wave 1	-.27**	-.19**	-.19**	-.21**	-.16**	-.15*	.32**	.33**	.21**	--	.51**	.43**
Wave 3	-.13**	-.14**	-.12	-.19**	-.21**	-.11	.17**	.32**	.23**	.49**	--	.54**
Wave 5	-.06	-.03	-.18**	-.12*	-.14*	-.23**	.16**	.20**	.34**	.42**	.56**	--

Correlations for women are above the diagonal; for men, below

* $p < .05$. ** $p < .01$

W5 variables. The model fit was acceptable, $\chi^2(6) = 8.66$, $p = .19$, CFI = .99, TLI = .99, RMSEA = .015, 95% CI [.000, .034]. Significant standardized paths are shown in Fig. 2. Depression positively predicted later depression and conflict and negatively predicted later relationship satisfaction. Conflict positively predicted later conflict and negatively predicted relationship satisfaction at W3 but not W5. Lastly, relationship satisfaction positively predicted later relationship

satisfaction but did not predict later conflict or depression. Thus, it appears that depression has a negative effect on later relationship satisfaction; however, relationship satisfaction does not appear to have an effect on later depression. This indicates a directional association between depression and relationship satisfaction.

Indirect paths were tested from W1 variables to W5 through W3 variables. Of the nine paths tested, three

Fig. 1 Cross-lagged path analysis for relationship quality and life satisfaction. Standardized path weights are presented. Path weights of non-significant paths and control variables are not depicted in the figure in order to ease interpretation. * $p < .05$. ** $p < .001$

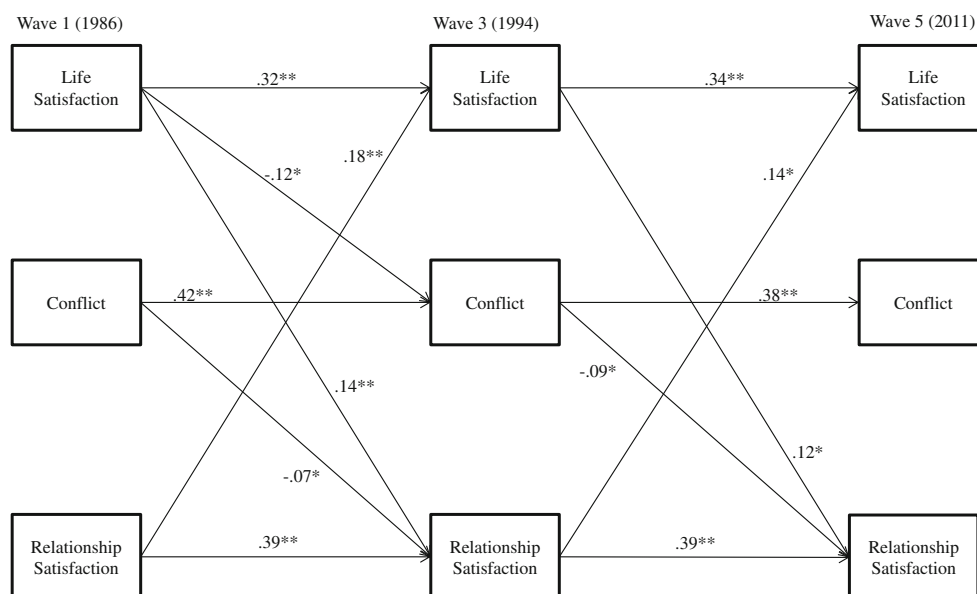
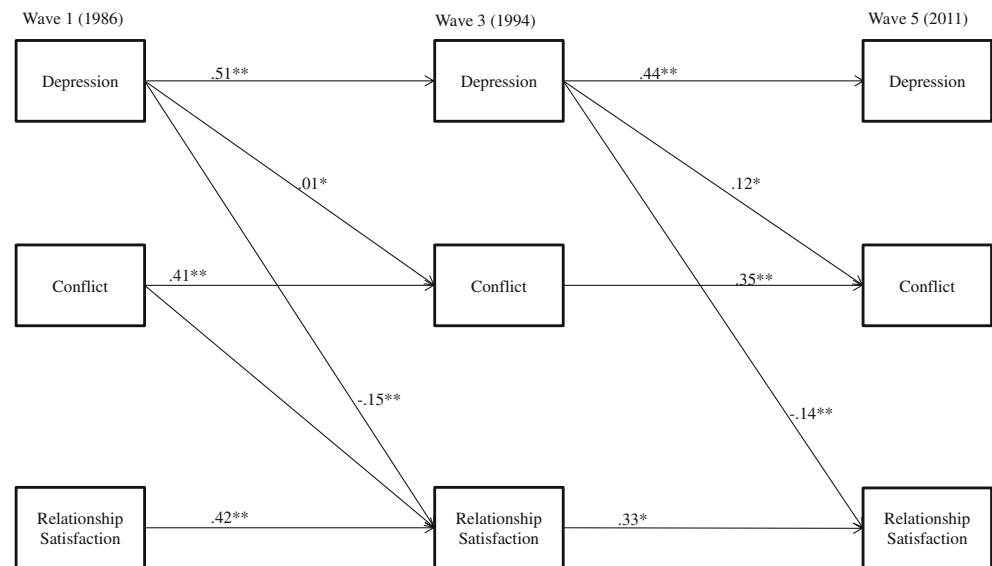


Fig. 2 Cross-lagged path analysis for relationship quality and depression. Standardized path weights are presented. Path weights of non-significant paths and control variables are not depicted in the figure in order to ease interpretation. * $p < .05$. ** $p < .001$



cross-variable indirect paths were significant. Both depression (W3) and relationship satisfaction (W3) mediated the relationship between depression (W1) and life satisfaction (W5). Thus, it appears that depression (W1) is relevant to later relationship satisfaction (W3) and depression (W3), both of which are relevant to later relationship satisfaction (W5). Relationship satisfaction (W3) mediated the relationship between conflict (W1) and relationship satisfaction (W5), indicating that conflict causes later relationship satisfaction. Lastly, conflict (W3) mediated the relationship between depression (W1) and later conflict (W5), suggesting that depression causes later conflict. (Standardized path weights of the indirect paths can be seen in Table 2s of the online supplement.)

Grouping Analyses CLPC

Using gender as a grouping variable and a series of chi-square difference tests, gender was tested as a moderator of each path in the life satisfaction CLPC (see Fig. 3). The model, with appropriately gender constrained paths, had acceptable model-data fit, $\chi^2(21) = 65.78$, $p = .44$, CFI = .67, TLI = .90, RMSEA = .050, 95% CI [.037, .064]. Notably, four paths, which remained significant for men, were not significant for women (see Fig. 3). Specifically, these paths were: (a) life satisfaction (W1) predicted later relationship satisfaction (W3), (b) conflict (W1) predicted later relationship satisfaction (W3), (c) life satisfaction (W3) predicted later relationship satisfaction (W5), and (d) relationship satisfaction (W3) predicted life satisfaction (W5).

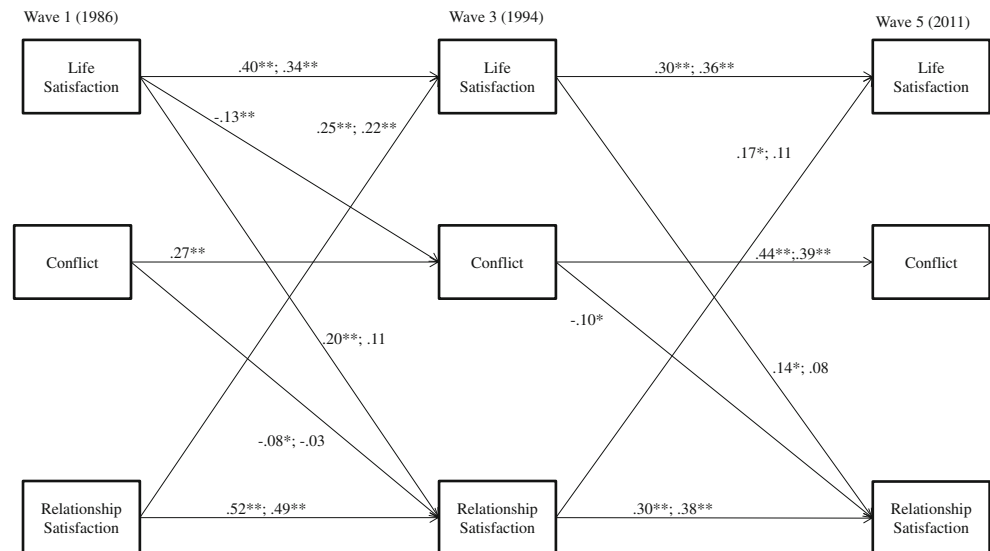
Focusing on these four paths, three indirect paths were examined to better understand the differences.

The first path examined life satisfaction (W3) as a mediator between relationship satisfaction (W1) and later relationship satisfaction (W5). This was not significant for men or for women. The next path examined relationship satisfaction (W3) as a mediator between life satisfaction (W1) and later life satisfaction (W5). This path was significant for men ($\beta = .03$, $p < .05$) but not for women ($\beta = .01$, $p = .32$). Thus, it appears that for men a cyclical relationship exists between life satisfaction and relationship satisfaction whereby life satisfaction (W1) predicts later relationship satisfaction (W3), which in turn predicts later life satisfaction (W5). However, this relationship is not present for women. The last path examined relationship satisfaction (W3) as a mediator between conflict (W1) and later life satisfaction (W5). This approached significance for men ($\beta = -.01$, $p = .07$) and was not significant for women ($\beta = -.002$, $p = .52$).

Using the same techniques, gender was tested as a moderator of the paths in the depression CLPC (see Fig. 4). The series of chi-square difference tests indicated that gender moderated four paths (see Fig. 4). Specifically, these paths were (a) depression (W1) predicted later relationship satisfaction (W3), (b) conflict (W1) predicted later relationship satisfaction (W3), and (c) conflict (W3), and relationship satisfaction (W3) predicted later depression (W5). (See Table 3s in the online supplement for a complete report of the chi-square difference tests.)

The final model, with the appropriately constrained paths, had acceptable model-data fit, $\chi^2(26) = 29.58$, $p = .61$, CFI = .99, TLI = .99, RMSEA = .013, 95% C.I. [.000, .031]. Based on these moderating paths, three specific indirect paths were tested. The first tested indirect path examined

Fig. 3 Cross-lagged path analysis for relationship quality and life satisfaction with paths that significantly differed by gender. Standardized path weights are presented. Path weights of non-significant paths and control variables were not depicted in the figure in order to ease interpretation. When single weights are reported for a path, these weights are for women and men combined; when two weights are reported, the first is for men; the second, for women. * $p < .05$. ** $p < .001$

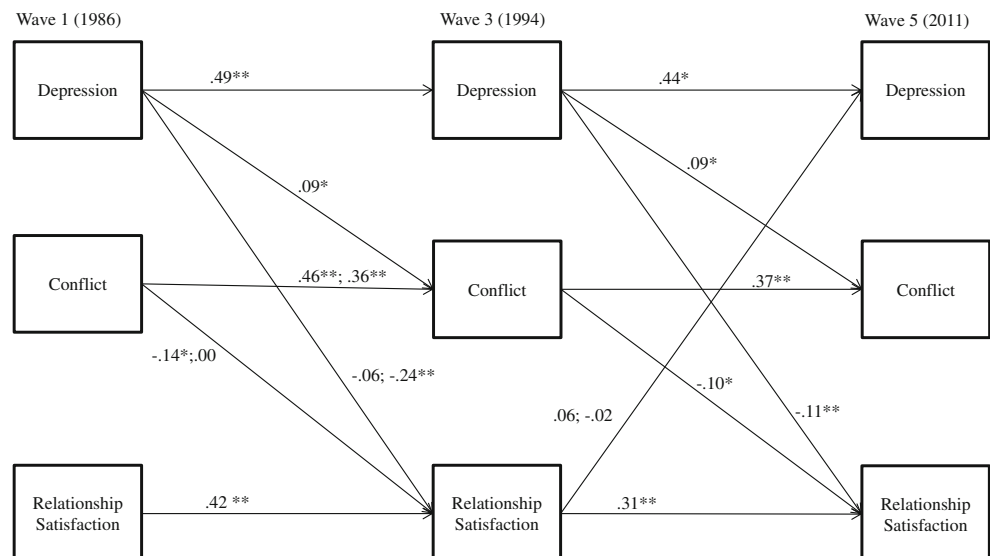


conflict (W3) as a mediator between conflict (W1) and later conflict (W5). This was significant for both men ($\beta = .18, p < .001$) and women ($\beta = .14, p < .001$). Thus, it appears that regardless of gender, conflict operates in a perpetuating fashion that persists over time. The second path examined relationship satisfaction (W3) as a mediator between depression (W1) and later depression (W5). This path was not significant for men ($\beta = -.003, p = .38$) or for women ($\beta = .004, p = .83$). The third indirect path examined relationship satisfaction (W3) as a mediator between conflict (W1) and later depression (W5). This again was not significant for men ($\beta = -.02, p = .33$) or for women ($\beta = .00, p = .99$).

Discussion

Inconsistent findings remain regarding directionality between marital quality and individual well-being and whether direction of influence differs for men and women. Using cross-lagged path analysis across three time points with a large, national sample, we addressed these discrepancies by examining the mutual influence of positive and negative dimensions of relationship quality (i.e. satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression) over time. Taken together, it appears that life satisfaction and relationship satisfaction share a cyclical relationship, such that life satisfaction is predictive of later relationship satisfaction and vice versa. However, when examining the negative

Fig. 4 Cross-lagged path analysis for relationship quality and depression with paths that significantly differed by gender. Standardized path weights are presented. Path weights of non-significant paths and control variables are not depicted in the figure in order to ease interpretation. When single weights are reported for a path, these weights are for women and men combined; when two weights are reported, the first is for men; the second, for women. * $p < .05$. ** $p < .001$



conceptualization of well-being model (i.e., the depression CLPC), depression did not share a cyclical relationship with relationship satisfaction and conflict. Rather, depression was predictive of later relationship (dis)satisfaction and conflict; however, neither relationship satisfaction nor conflict predicted later depression. Further, our study sought to determine if gender moderated the mutual influence of positive and negative dimensions of relationship quality and individual well-being over time and if so, how? It appears that for women, depression (i.e., the negative conceptualization of well-being) affected women's relationship quality whereas life satisfaction (i.e., the positive conceptualization of well-being) affected men's relationship satisfaction more.

According to the marital discord model (Beach et al. 1990), marital quality directly influences later individual well-being, whereas the stress-generating model (Davila et al. 1997; Hammen 2006) posits that the association between relationship quality and individual well-being is bidirectional. Although relationship satisfaction and life satisfaction have been shown to be related (Glenn and Weaver 1981), the direction of this relationship was not clear. The results of our study support the stress-generating model with regard to positive indicators of well-being. Life satisfaction and relationship satisfaction have a positive bidirectional influence across the three time points whereas no other pair of variables displayed a cyclical relationship.

Unexpectedly, the depression CLPC did not replicate the stress-generating model or the marital discord model because depression was a consistent predictor of later relationship satisfaction and conflict. The marital discord model was developed for clinical populations, and the current sample predominantly reported high relationship satisfaction and low conflict. Perhaps the interaction of depression and relationship quality is different among non-clinical couples than a clinical sample. Further, our study examined variables over a 25-year period, and most empirical support for these theoretical models is over a much shorter time period. Therefore, perhaps the direction of influence is different over longer periods of time.

The present study also sought to determine if gender moderated the mutual influence of positive and negative dimensions of relationship quality (i.e., relationship satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression) across three time points. Our findings showed mixed support for previous research. For depression, there were no cyclical or direct paths that were significant for only men or only women across each of the three time points. However, there were several paths that differed for men and women across two time points. For women, depression (W1) predicted later relationship satisfaction (W3), but this was not true for men. Also, depression (W1) predicted later conflict (W3) for both men and women. This is in the opposite direction of what was previously found (Beach et al. 2003;

Davila et al. 2003) and the opposite gender pattern of what Dehle and Weiss (1998) found. However, depression (W3) was negatively related to later relationship satisfaction (W5) at the same magnitude for both men and women. It is plausible that there are gender differences in how depression is associated with relationship satisfaction earlier in life and that perhaps these gender differences disappear in later life. This interpretation is consistent with previous research suggesting that gender roles among older couples are less distinct (Beach et al. 2003).

Most of the previous research has focused on the negative dimensions of individual well-being such as depression. We found that life satisfaction, a positive conceptualization of individual well-being, affected men more so than women. For example, in the cyclical indirect path where life satisfaction (W1) predicted relationship satisfaction (W3), which predicted life satisfaction (W5), was significant for men but not women. This could mean that, when considering men and positive constructs of well-being, such as life satisfaction, the stress-generating model is supported because these constructs have a bidirectional influence. However, when considering women, it appears that relationship quality is more strongly related to negative dimensions of individual well-being, such as depression, rather than positive dimensions, such as life satisfaction. Poor romantic relationship quality may have a greater influence on women's individual well-being (Beach et al. 2003; Davila et al. 2003) whereas forces outside of the relationship, such as social support (Acitelli and Antonucci 1994), may be more influential on women's reports of life satisfaction.

Limitations

Our study offers a number of strengths, including longitudinal data, a large national sample, and an examination of positive and negative aspects of relationship quality (i.e., relationship satisfaction and conflict) and individual well-being (i.e., life satisfaction and depression). Furthermore, the present study examined how the interaction between relationship quality and individual well-being differs by gender by examining differential patterns of how different aspects of life interact over time (rather than simply examining mean differences).

Although our study offers a number of strengths, it is important to discuss its notable limitations. First, Latino/a participants are underrepresented in our sample and there are no reports from same-sex couples; therefore, these findings cannot be generalized to all individuals in relationships. Second, individual reports of relationship quality and individual well-being were examined, limiting the ability to control for partners' reports of these same variables. Further, there is no way to know if the outcomes are influenced by the individual or his

or her partner. Third, the time points span large periods of time; therefore, multiple events that are not controlled for (e.g., changes in work status or relationship status) could have occurred in the interim and influenced reports of well-being and relationship quality. Fourth, multiple constructs are measured using a single item, which can increase measurement error and, consequently, increase estimation bias. Although this is a common tradeoff for large national datasets, future research may benefit from assessing life satisfaction, relationship satisfaction, and conflict using multiple-item measures to see if these findings replicate.

Fifth, depression and life satisfaction were not included in the same model. As a result, it cannot be concluded that improving life satisfaction would influence relationship outcomes, without changes in depression, because level of depression was not controlled in the model; the same can be said for depression. Because depression and life satisfaction were not included in the same model, it cannot be concluded that one is more or less influential than the other; it can only be concluded that differences in patterns exist. Finally, several of the tests of gender differences were significant. Due to the number of difference tests run, future research should replicate these gender differences to ensure findings were not due to chance (i.e., a Type I error). That said, our study contributes to the field's understanding of the complex relationships among relationship quality, depression, and life satisfaction for men and women, and it offers a foundation for future research to continue refining this model.

Future Research Directions

Relationship quality and individual well-being are complex and can be measured in multiple ways. These findings are a glimpse of the actual process between the two constructs. Future research should examine various aspects of relationship quality that might be driving its association with individual well-being, such as intimacy and communication patterns (e.g., demand-withdraw). Similarly, alternative conceptualizations of individual well-being could be considered for both positive (e.g., happiness, self-esteem, optimism, etc.) and negative (e.g., anxiety, stress, etc.) dimensions. It is important to examine whether positive and negative dimensions of individual well-being buffer each other against change among different dimensions of relationship quality. Also, there is evidence that individual well-being is a mediator through which relationship quality influences physical health for men and women (Priest and Woods 2015; Roberson et al. 2017a, b). Therefore, future research would expand these findings by examining positive and negative constructs of mental health that may mediate the associations among relationship quality and subjective and objective physical health.

Finally, our study should be replicated using a sample that includes both relationship partners. Dyadic data analyses,

such as the actor-partner interdependence model (Kenny et al. 2006), accounts for non-independence among couples and examines mutual influence over time. These types of models may help to explain the diverging results found between men and women and positive and negative aspects of individual well-being.

Practice Implications

The findings from our study point to several implications for mental health practitioners working with individuals or couples. First, it appears that life satisfaction can influence reports of relationship satisfaction, and life satisfaction can be improved through promoting relationship satisfaction, particularly for men. In practice, professionals may consider focusing, even briefly, on clients' reports of how satisfied they are with their life and identify factors that may be positively or negatively influencing their life satisfaction. Positive psychology's core focus is to increase individuals' life satisfaction as well as reducing distress (Baumgardner and Crothers 2009). These findings indicate that when working toward improving relationship satisfaction, attending to life satisfaction could be fruitful.

Also, depression, especially for women, appears to negatively affect later relationship satisfaction. Therefore, practitioners should assess for depression when clients, particularly women, report decreased satisfaction with their relationship as a primary concern. Although it is common to assess for mood disturbances, such as depression (Groth-Mamat 2009), these results indicate that it may be useful for practitioners to inquire about their client's individual well-being, even when their primary concern is relationship satisfaction.

When working with couples in treatment, it will be important to gain a rich understanding of the couple's functioning, but also the functioning of the individuals within the dyad (Epstein and Baucom 2002). As our study indicates, when working to improve relationship quality, intervening on life satisfaction may be more effective for alleviating men's relationship distress and improving his overall relationship and life satisfaction, whereas intervening on depressive symptomatology may be more successful for promoting relationship satisfaction in women.

Conclusions

Our study is the first known to examine the interaction between relationship quality and individual well-being over time using a positive and negative conceptualization of relationship and individual well-being. Furthermore, our study differentiated how these variables interact differently for men and women, with men's relationship satisfaction sharing a cyclical relationship with life satisfaction and women's relationship satisfaction being affected more by depression, or more negative

aspects of individual well-being. Thus, it is important to consider not only positive and negative aspects of well-being, but also how they interact differently for men and women. Our study offers a more precise understanding of the longitudinal interaction between individual well-being and relationship quality for men and women.

Compliance with Ethical Standards

Conflict of Interest To the best of our knowledge there are no conflicts of interests for myself or any of the co-authors which would be seen as influencing this research.

Human and Animal Rights This research involved the participation of Human Participants.

Informed Consent All subjects were given adequate informed consent before taking part in the study. Thank you for your consideration of our manuscript.

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