

## Transactional Associations between Couple Relationship Quality and Depressive Symptoms

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Globally, depression has been one of the leading causes of *estimated years of life lost due to disability or burdensome diseases* (i.e., YLD) over the past decade (WHO Department of Information, Evidence and Research, 2016). Major depressive disorder is the most prevalent lifetime disorder in the United States. The prevalence is particularly high for individuals aged between 30 and 44 (19.8%), and between 45 and 59 (18.8%; Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). Numerous efforts have been made to understand the predictors and sequelae of depressive symptoms (e.g., Feng, Shaw, Skuban, & Lane, 2007; Jacobson & Newman, 2017; Nolen-Hoeksema, Girgus, & Seligman, 1992). Among individuals in close relationships, poor marital and couple relationship quality has been identified as one of the important antecedents of depressive symptoms, and at the same time, an outcome of depressive symptoms (Robertson, Lenger, Norona, & Olmstead, 2017; Whisman & Uebelacker, 2009).

A large body of research has documented associations between couple relationship quality and depressive symptoms (e.g., Figueiredo, Canário, Tendais, Pinto, Kenny, & Field, 2018; Gangamma, Bartle-Haring, Holowacz, Hartwell, & Glebova, 2014; MacKenzie, Smith, & Uchino, 2014; Morgan, Durtschi, & Kimmes, 2018; Wang, Xie, Wang, Wang, & Lei, 2017). However, the directionality of such associations is debated. Whereas some studies suggested that depressive symptoms led to declines in couple relationship quality (Cummings et al., 2005; Gangamma et al., 2014; Knobloch & Knobloch-Fedders, 2010; MacKenzie et al., 2014; Robertson et al., 2017), several others indicated that better relationship quality resulted in

alleviation of depressive symptoms (e.g., Figueiredo et al., 2018; Stapleton et al., 2012; Du Rocher Schudlich, Papp, & Cummings, 2011; Kouros, Papp, & Cummings, 2008).

In a 21-year longitudinal study, Najman, Khatun, Mamumn Clavarino, Williams, and Scott (2014) observed the transactional associations between poor marital relationship quality and elevated depressive symptoms among women. In a population representative sample of couples aged 50 or older, Whisman and Uebelacker (2009) found that baseline husband and wife depressive symptoms and marital discord were predictive of later depressive symptoms and marital discord reported by oneself and one's partner. Building upon the current knowledge on couple relationship quality and depressive symptoms, the current study expands the extant literature by simultaneously examining bidirectional associations between each partners' perceptions of couple relationship quality and depressive symptoms in a sample of coparents. We aim to test a comprehensive transactional model of these two constructs, to reveal the direction of the associations between couple relationship quality and not only one's own but also one's partner's depressive symptoms.

### **Theoretical Perspectives**

Three prominent interpersonal theories of depression have guided the investigation of the associations between depressive symptoms and couple relationship quality (Rehman, Gollan, & Mortimer, 2008). Coyne's (1976/1999) interactional theory of depression and Beach, Sandeen, and O'Leary's (1990) marital discord model suggest that depressive symptoms lead to decline in couple relationship quality. Specifically, Coyne (1976/1999) indicates that depressed individuals tend to seek constant support and reassurance from their partners to soothe their distress. Their partners may be able to provide the support initially, but often fail to continuously provide the amount of support that their depressed partners require. When the supply of support does not

meet their need, depressed individuals may display behaviors that sabotage their romantic relationships as a result of frustration and desperate attempts to regain support. These interactional patterns lead to worsened couple relationship qualities. Beach et al.'s (1990) marital discord model posits that depressive symptoms may result in decline of marital relationship quality through lack of coping or cohesion, or absence of partner support, acceptance, and intimacy.

In addition to the direction from depressive symptoms to declines in marital quality, Beach et al.'s (1990) marital discord model also proposes that marital discord results in greater levels of depressive symptoms through hostility, disapproval, accusations, harsh depreciation and belittlement from their partners, fears of splitting up, disturbance of day-to-day routines, and other stressors. With cohabiting couples becoming increasingly normative (Kamp Dush, Cohan, & Amato, 2003), these theories may be generalizable to unmarried couples.

Hammen's (2006) *stress generation* perspective suggests that depressive symptoms tend to place individuals at risk for more intense stress in close relationships, thereby resulting in lower relationship quality. The chronic stress stemming from low-quality couple relationships could in turn lead to elevated the levels of depressive symptoms. As such, the situation turns to a vicious cycle. Embedded within these theoretical perspectives is a transactional model of the reciprocal links between couple relationship quality and depressive symptoms. Moving beyond the debate of which factor precedes the other, multi-wave data in large longitudinal investigations, together with advances in statistical methodologies, allow for a more thorough understanding of reciprocal influences between couple relationship quality and individual depressive symptoms (Rehman et al., 2008).

From the perspective of family systems theories (Cox & Paley, 1997), in addition to the associations between one's perceptions of couple relationship quality and their own depressive symptoms (i.e., actor effect; Cook & Kenny, 2005), one's depressive symptoms and ratings of couple relationship quality may be linked to their partner's depressive symptoms and ratings of couple relationship quality (i.e., partner effect). According to the family systems perspective, the functioning of individuals and family subsystems can be fully understood only when families are considered as a "complex, integrated wholes" (Minuchin, 1988, p. 8). Individual functioning stems from its family context and results from the interactions of all the parts and subsystems of the families. For example, Morgan et al. (2018) found that women's and men's depressive symptoms was not only predicted by their own relationship and sexual satisfaction, but also their partner's relationship satisfaction. Moreover, Du Rocher Schudlich et al. (2011) found that wives' relationship dissatisfaction was predictive of husbands' anger and constructiveness during conflict resolution, which in turn predicted the husband's depressive symptoms.

Depressive symptoms are generally more prevalent and severe among women compared to men (Culbertson, 1997; Kessler, 2003). Experiences in couple relationships and assessments of couple relationship quality can also differ by gender (Doss, Rhoades, Stanley, & Markman, 2009). Moreover, gender plays an important role when examining the strength and directionality of the association between individual depressive symptoms and couple relationship quality (Feder, Heatherington, Mojtabai, & Eaton, 2018; Fincham, Beach, Harold, & Osborne, 1997; Robertson et al., 2017). For example, Fincham et al. (1997) found that while depressive symptoms preceded marital satisfaction for men, the reverse was true for women. Feder et al. (2018) reported that associations between marital support and mental health were only detected among women but not men. Such findings highlight the importance of examining potential

gender differences when investigating the associations between couple relationship quality and individual depressive symptoms.

The current study focused on the depressive symptoms and couple relationship functioning of a sample of couples who participated in the NICHD Study of Early Child Care and Youth Development (SECCYD) and therefore also parents of at least one child. Although many studies in the literature on couple relationship quality and depressive symptoms have focused on particular points in the life course (e.g., transition to parenthood or later life), depressive symptoms are prevalent between the ages of 30 and 59 (Kessler et al., 2005), a period of the life course in which XX% of U.S. adults are parenting children. In the current study, we aim to test the transactional associations between depressive symptoms and couple relationship quality of both partners over time. We have several hypotheses about the associations:

- 1) Higher levels of depressive symptoms of earlier time points would predict one's own higher levels of depressive symptoms at the next time point; similarly, couple relationship quality would predict one's own couple relationship quality in the next report (autoregressive stability paths).
- 2) Higher levels of depressive symptoms of earlier time points would predict decline in couple relationship quality rated by themselves the next time point; additionally, one's couple relationship quality would predict decreases in their own depressive symptoms (actor effect between construct cross-lagged paths).
- 3) Each partner's depressive symptoms at earlier time point would predict their partner's higher levels of depressive symptoms subsequently; and similarly, one's perceptions on couple relationship quality would positively predict their partner's next rating on couple relationship quality (actor-partner within construct cross-lagged paths).

- 4) Higher quality of couple relationships perceived by one individual would predict fewer later depressive symptoms of their partners'; similarly, greater levels of depressive symptoms would predict lower couple relationship quality rated by their partners (actor-partner between construct cross-lagged paths).

## Method

### Sample

Data were drawn from NICHD-SECCYD. Participating families ( $N = 1,364$ ) were recruited at 10 sites across the United States. They were followed from 1 month after the birth of the target child in 1991, to 15 years of age over 4 phases of study. NICHD Early Child Care Research Network (2004) provided details on recruitment and sampling procedures of the larger-scale SECCYD. The current study used data primarily from Phases 2, 3, and 4 at 6 time points (target child at 54 months, Grades 1, 3, 5, 6, and age 15). Additionally, we included demographic information gathered at 1 month postpartum as covariates. To be included in the restricted sample, all participants had to respond to the residence status and relationship with target child for at least one time point, and never indicated nonresidence status or relationships other than biological parents<sup>1</sup>. The inclusion criteria resulted in a sample with 654 pairs of coresident biological fathers and mothers, out of the 1,364 families that participated in SECCYD.

Most women were White (90.7%;  $n = 593$ ), with remaining being Black (5.20%;  $n = 34$ ), Asian and Pacific Islander (1.07%;  $n = 7$ ), American Indian, Eskimo, Aleutian (0.46%;  $n = 3$ ), or Other (2.60%;  $n = 17$ ). Most men were White (90.98%;  $n = 595$ ) and Black (5.05%;  $n = 33$ ) as well. Women's age at child birth (i.e., 54 months prior to Time 1 of this study) ranged from 18 to 46, with a mean of 30.04 ( $SD = 4.98$ ). Women received 7 to 21 years of education ( $M = 15.09$ ,

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<sup>1</sup> Including only biological parents ensured that there was no change of partners in the sample.

$SD = 2.33$ ). Men received 7 to 21 years of education ( $M = 15.28$ ,  $SD = 2.65$ ). Most women (96.63%;  $n = 632$ ) and men (96.17%;  $n = 629$ ) graduated from high school, with 51.83% of women ( $n = 339$ ) and 52.59% of men ( $n = 344$ ) received a bachelor's degree or higher. At the first time point (target child at 54 months), 606 (92.66%) pairs of couples were married, and the mean household income-to-needs ratio was 4.30 ( $SD = 3.46$ ). Approximately 57% of families reported household income scored above 3 on the income-to-needs ratio (indicating middle class), whereas 16.06% and 2.58% of families scored below 2 (indicating low income) and 1 (indicating poverty), respectively (Dearing, McCartney, & Taylor, 2001).

### **Procedure**

At 1 month after childbirth, the participants reported basic demographic characteristics of their families, including women's age, women's and men's race, women's and men's years of education. At 54 months, women reported on their marital status and family income. Based on the sizes and locations of the families, the study investigators computed and provided an income-to-needs ratio for each family. At 54 months, Grades 1, 3, 5, 6, and age 15, women and men rated their couple relationship quality on a subscale of *Personal Assessment of Intimacy in Relationships* (PAIR), and depressive symptoms on *Center for Epidemiological Studies Depression Scale* (CESD).

### **Measures**

**Depressive symptoms.** Participants reported their depressive symptomology on the 20-item *Center for Epidemiological Studies Depression Scale* (CESD; Radloff, 1977), a widely used self-report measure of depressive symptoms among general population. The participants responded on a 1 to 4 point Likert scale (1 = "Less than once a week"; 4 = "5-7 days a week") to rate the frequency for them to experience depressive and sad feelings (e.g., "I felt that I could not

shake off the blues even with the help of my family/friends”). Among the six time points, the internal consistencies ranged between .89 and .91 among the women, and between .83 and .90 among men in this sample.

**Couple relationship quality.** Participants reported their couple relationship quality on 6 items from the *Personal Assessment of Intimacy in Relationships* (PAIR; Schaefer & Olson, 1981) on a 5-point Likert scale, with 1 representing strongly disagree, and 5 representing strongly agree. Participants were instructed to think about the relationship with their spouse or partner and rate to what extent they agree with the statements (e.g., “My spouse/partner can really understand my hurts and joys”). The scale showed good internal consistency among men and women in this sample ( $\alpha$ 's ranging between .84 to .90 for women, and between .82 to .88 for men).

### **Analytic Plan**

To examine the reciprocal associations between depressive symptoms and couple relationship quality of men and women over time, a Random Intercept Cross Lagged Panel Model (RI-CLPM; Hamaker, Kuiper, & Grasman, 2015) for two dyadic variables using structural equation modeling. Autoregressive cross lagged models can examine the stability and temporal ordering of related constructs. RI-CLPM is an improvement over traditional Cross Lagged Panel Models (CLPM) in that it appropriately accounts for the “trait-like, time-invariant” between-individual differences in the constructs of interest (Hamaker et al., 2015). Therefore, RI-CLPM may provide more accurate parameter estimates for the within-individual processes between couple relationship quality and depressive symptoms.

Due to model complexity, it was difficult to demonstrate the visual presentation of the full model. Instead, we provided an illustration of the RI-CLPM using two out of the four



variables of interests (women perceived relationship quality and women's depressive symptoms) in Figure 1. Men's depressive symptoms and men perceived relationship quality was examined in the same model, but they were omitted in the figure. Specifically, two sources of impact determined the observed constructs of interest (i.e., depressive symptoms, couple relationship quality): state constructs (i.e., latent variables  $MRQ_{1-6}$  and  $MD_{1-6}$  in Figure 1) and trait construct (i.e., latent variables *trait MRQ* and *trait MD* in Figure 1). The trait constructs were allowed to be correlated with one another, and the state constructs at the same time point were also allowed to be correlated. Some demographic characteristics (i.e., women's age, marital status, socioeconomic status) were included as the time-invariant covariates for the trait constructs. Cross-lagged paths (i.e.,  $\beta$  and  $\gamma$  in Figure 1) between state constructs were included to examine the reciprocal relations among the constructs of interest while autoregressive paths (i.e.,  $\alpha$  and  $\delta$  in Figure 1) are controlled for methodological reasons.

Notably, because we have many waves of data and do not have reasons to expect the autoregressive and cross-lagged paths for any constructs to vary across time points, the coefficients for each autoregressive and cross-lagged path from one time point ( $T = t$ ) to the next time point ( $T = t+1$ ) were constrained to be equal at each wave ( $t = 1, 2, 3, 4,$  and  $5$ ) to increase model parsimony and parameter estimation accuracies. For instance, the association between women reported relationship quality and women's depressive symptoms at the next time point was considered to be equal across all time points (labeled as  $\alpha$  in Figure 1). To accommodate for the non-normality, the RI-CLPM was estimated with the robust maximum likelihood estimator (MLR) using the lavaan package in R.

Moreover, as a preliminary step, we examined what proportion of variance of the constructs of interest was explained by stable trait component (ST), autoregressive trait

component (ART), and state component (S) with univariate latent STARTS model (Kenny & Zautra, 1995, 2001), also in the lavaan package. The latent STARTS model partition variance of constructs measured at each time point into three latent components: (1) a trait component that does not change, (2) an autoregressive component that is a function of the construct at the previous time point and (3) a state component that includes measurement error and time-specific variance. In the STARTS model, the latent components (i.e., ST, ART, S) were assumed to be uncorrelated with each other, therefore, the covariance among the three components were set to be 0. Moreover, the loadings of ART, the coefficients of the autoregressive paths, the loadings of ST, and the variances of S were all constrained to be equal across time points.

The model chi-square with its degrees of freedom and  $p$  value, Steiger-Lind root mean square error of approximation (RMSEA; Steiger, 1990) and 90% CI, Bentler comparative fit index (CFI; Bentler, 1990), and standardized root mean square residual (SRMR) of each model were considered to evaluate the model fit as recommended by Kline (2015). For the model chi-square test, the null hypothesis was that the variance-covariance matrices of the observed data and the proposed model are the same, therefore, non-significant test results would suggest good fit. RMSEA values below .05 were indicative of close fit (Browne & Cudeck, 1992). Moreover, RMSEA 90% lower confidence limit less than .05, and 90% upper confidence limit less than .08 were considered acceptable. CFI values greater than .95 and SRMR values less than .08 indicated good fit (Hu & Bentler, 1999).

## Results

### **Preliminary Analyses**

Means, standard deviations, missing rates, internal consistencies, and correlations among study variables and continuous demographic variables are presented in Table 1. Results of

Little's MCAR test indicated that the missing mechanism was MCAR  $\chi^2(2,643) = 2,724.06, p = .13$ . Therefore, the missingness was ignorable, and full information maximum likelihood method was used to handle the missing data. Married and cohabiting couples did not differ in relationship quality reported by men or women at any time point. However, married couples showed fewer depressive symptoms. Except for women reported relationship quality at Time 3, the study constructs did not differ for families with white versus non-white women. Table 2 showed the detailed two sample comparison t-test results.

### **Latent STARTS Model Results**

To partition the variation into trait, autoregressive, and state variances in women's depression, men's depression, women-reported and men-reported relationship quality, we ran four univariate models, one for each construct. For women-reported relationship quality, we found that 33.4% of variation was explained by the unchanging trait component, 38.9% was explained by the slow-changing autoregressive component, and the remaining 27.7% was explained by the fast-changing, random state component. Moreover, 42.4%, 25.3, and 32.3% of variation in women's depressive symptoms was explained by trait, autoregressive, and state components, respectively. For men-reported relationship quality, 57.1% was explained by the trait component, 22.3% was explained by the autoregressive component, and 20.6% was explained by the state component. For men's depression, 48.5%, 17.4%, and 34.1% of variation was explained by the trait, autoregressive, and state components.

### **RI-CLPM Results**

The RI-CLPM including trait and state depressive symptoms and couple relationship quality for both men and women demonstrated excellent fit,  $\chi^2(314) = 450.24, p < .001$ ; RMSEA = .027 (90% CI = .021, .033); CFI = .98; SRMR = .05. As summarized in Table 3, the

autoregressive paths showed that earlier women's depressive symptoms predicted their own subsequent depressive symptoms ( $\beta = 0.17, p < .001$ ). Similarly, earlier men's depressive symptoms, women-perceived, and men-perceived couple relationship quality predicted later men's depressive symptoms ( $\beta = 0.19, p = .001$ ), women-perceived ( $\beta = 0.13, p < .001$ ), and men-perceived couple relationship quality ( $\beta = 0.18, p < .001$ ) respectively.

As shown in Table 3, results of the cross-lagged paths showed that higher couple relationship quality perceived by men ( $B = 0.12, \beta = 0.10, p = .001$ ) and women ( $B = 0.08, \beta = 0.08, p = .005$ ) predicted their partner's perceptions of higher couple relationship quality at the next time point. Moreover, better women-perceived couple relationship quality predicted lower levels of women's depressive symptoms at the next time point ( $B = -0.74, \beta = -0.07, p = .006$ ), while the reverse was not true. Lower levels of men's depressive symptoms predicted better men-perceived relationship quality ( $B = -0.01, \beta = -0.08, p = .022$ ), while the other direction was nonsignificant. We did not detect prospective associations between women's depressive symptoms and couple relationship quality reported by either men or women. Neither did we find any cross-lagged links between one's own depressive symptoms and one's partner's depressive symptoms. There were also no significant cross-lagged partner effects across constructs between one's depressive symptoms with their partners' couple relationship quality.

Moreover, the traits of women's and men's depressive symptoms, and relationship quality reported by women and men were inter-correlated (see Table 4). Not surprisingly, women's trait depression was positively associated with men's trait depression. Trait women- and trait men-reported relationship quality were positively correlated. Both men's and women's trait depression were negatively associated with relationship quality reported by themselves and their partner. The statistical details and a list of error correlations of constructs at each time point

can be found in Table 4. In Table 5, we presented results on how demographic covariates were associated with trait components of women and men reported relationship quality, and men's and women's depressive symptoms.

### Discussion

The present study was the first to test a comprehensive transactional and bidirectional model of depressive symptoms and couple relationship quality perceived by both partners, benefitting from multi-wave longitudinal data with a large sample size and advanced multivariate data analytical techniques. These findings underscore the significance of considering close interpersonal relationships and taking a family systems perspective in efforts to understand and promote mental health. Specifically, regarding the prospective associations across depression and relationship quality, we found that women's better relationship quality predicted decrease in women's depressive symptoms. For men, higher level of depressive symptoms predicted worse relationship. For the relationship quality across partners, we found that one's rating of relationship quality predicted their partner's feeling about relationship quality at the next time point.

#### **Relationship Quality and Depressive Symptoms: Actor Effects**

Greater women-perceived couple relationship quality predicted lower levels of women's depressive symptoms at the next time point. This is consistent with previous research findings that lower-quality couple relationships being associated with fewer depressive symptoms (Du Rocher Schudlich et al., 2011; Figueiredo et al., 2018; Morgan et al., 2018). At the transition to parenthood, mothers and fathers with high negative interaction scores experienced a steeper increase in depression from 3- to 30-months postpartum (Figueiredo et al., 2018). Greater sexual and relationship satisfaction scores were significantly associated with decrease in their own

depressive symptoms trajectories, but only relationship satisfaction was linked with their partners' depressive symptoms trajectories (Morgan et al., 2018). Du Rocher et al. (2011) found that marital dissatisfaction can be associated with depressive symptoms through increasing depressive conflict and decreasing constructive conflict.

Higher levels of men's depressive symptoms prospectively predicted decline in couple relationship quality perceived by themselves. This association has been previously detected in diverse populations (e.g., Bradford, Adler-Baeder, Ketring, Bub, Pittman, & Smith, 2014; Gangamma et al., 2014; MacKenzie et al., 2014; Robertson et al., 2017). Robertson and colleagues (2017) found that only for women, but not for men, depression was related to subsequent relationship satisfaction. In two other studies, depressive symptoms of men and women were associated with not only one's own but also one's partner's report on couple relationship quality (Knobloch & Knobloch-Fedders, 2010), more so for Caucasian couples than for African American couples (MacKenzie et al., 2014).

Together, these findings partially supported the bidirectional associations between depressive symptoms and couple relationship quality, as suggested by marital discord model (Beach et al., 1991), stress generation perspective (Hammen, 2006), and Coyne's interactional theory of depression (Coyne, 1976/1999). Interestingly, among men and women, we found the reverse directionality of the effects between depressive symptoms and one's own couple relationship quality. For men, the depressive symptoms might precede couple relationship quality; whereas for women, depressive symptoms might follow (or be subsequent to) a toxic couple relationship. These findings are exactly replicating Fincham and colleagues's (1997) finding on the causal direction of marital satisfaction and depressive symptoms among 150 pairs of husbands and wives observed over an 18-month interval right after the participants were

married. Our findings were also consistent with Dehle and Weiss' (1998) investigation on sex difference in the longitudinal relations between marital quality and depressed mood among 47 recently married couples over a three-month interval, where they found the prospective links between marital quality and later depressed mood was stronger for women than for men. A post doc speculation to explain the gender difference in such temporal precedence is that, women might be more empathetic in social relationships, as shown both on self-report on empathy questionnaires, and neurological reactivity of right brain in emotional identification tasks (Rueckert & Naybar, 2008). Higher empathy may be one of the mechanisms linking close relationships to psychological well-being (Thoits, 2011). As for the link between depressive symptoms and subsequent decline in relationship quality among men but not women, it could be because depressed individuals less frequently engage in sex (Nicolosi, Moreira Jr, Villa, & Glasser, 2004) – an component of romantic relationship that is relatively more valued by men than women in opposite-sex couples (Brinbaum, Reis, Mikulincer, Gillath, & Orpaz, 2006).

### **Relationship Quality: Partner Effects**

Better couple relationship quality perceived by one partner could longitudinally predict their partner's more positive ratings of couple relationship quality. This finding was consistent with the growing literature on the interdependence of partners' experiences in couple relationships among both heterosexual (e.g., Chow, Buhrmester, & Tan, 2014; Yan, Olsavsky, Schoppe-Sullivan, & Kamp Dush, 2018) and homosexual populations (e.g, Clausell & Roisman, 2009; Starks & Parsons, 2014).

### **Summarizing the Null findings**

We did not have enough evidence to make conclusions about the partner effects in the prospective links between couple relationship quality and depressive symptoms. Neither do we

find support for the partner effects in men and women's depressive symptoms. It could be that, in the complex dynamic of close relationship and individual well-being among people and their partners, these paths were not the major/dominating paths that explain the transactional associations among one's own and one's partners' depressive symptoms and perceptions about couple relationship quality, especially after the other significant sources of antecedents were taken into account.

### **Variance Decomposition: Trait, Autoregressive, and State Variances**

Considerable amount of variance in men's and women's report of depressive symptoms and couple relationship quality across time can be attributable to trait constructs, state constructs, and autoregressive variance. Though this was not formally tested, men's ratings seemed to a little more stable (higher percentage of trait variance). [and explanations / implications?]

### **Predictors of Trait Constructs**

Higher household income to needs ratio was associated with women's better trait relationship quality and fewer depressive symptoms. Women's age at the start of data collection was found to be negatively related to women's trait depressive symptoms and men's trait relationship quality. In other word, elder women in the sample was consistently less depressed over the study period, however, their partners were consistently reporting lower relationship quality. Women's higher levels of education were linked to lower levels of women's trait depressive symptoms, whereas men's higher levels of education were associated with both men's and women's fewer trait depressive symptoms. Married men were consistently less depressed (i.e., had lower trait depressive symptoms). All the trait latent variables were highly correlated with one another.

### **Limitations**



The findings should be interpreted with several limitations in mind. First, couple relationship quality and depressive symptoms of men and women were all measured with self-reports, which may be subject to response bias. Second, the general NICHD sample, and particularly the current selected sample, was disproportionally contained European American, married, opposite-sex highly educated, and high socioeconomic status couples who gave birth to at least one child and stayed together at least until their child (or one of their children) reached the age of 15. The relationship dynamic among other populations might be different, therefore, the transactional associations between couple relationship quality and depressive symptoms among more diverse populations need to be examined.

### **Contribution and Implications**

This was the first study to test a comprehensive transactional and bidirectional model of depressive symptoms and couple relationship quality perceived by both partners, benefitting from the multi-wave longitudinal design with large sample size, and the advances in multivariate data analytical techniques. This study also introduced a novel approach to building RI-CLPM into an Actor Partner Interdependence Model (APIM) framework to study the complex dynamics linking family relationships and mental health. The current study can inform practitioner efforts to reduce depression, facilitate mental health, and improve family functioning by highlighting the temporal precedence of couple relationship quality in associations with depressive symptoms among women and the reverse directionality among men. The findings underscored the significance of considering close interpersonal relationships and taking an interdependence perspective in efforts of understanding and promoting mental health.

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Table 1

Means (M), Standard Deviations (SD), Missing Rates, and Internal Consistencies (α) of Main Study Variables and Covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
M	3.89	4.00	8.29	6.94	3.94	4.01	6.98	6.86	3.90	4.01	7.52	7.51	3.88	3.99	7.40	7.17	3.84	3.97	7.61	7.15	3.77	3.94	8.91	7.91	30.04	15.08	15.28	4.30	
SD	0.82	0.80	7.51	6.06	0.87	0.84	7.41	6.55	0.85	0.82	7.62	7.28	0.96	0.84	7.55	6.89	0.98	0.91	8.30	7.89	0.99	0.91	8.77	7.16	4.98	2.33	2.65	3.46	
Missing Rate	.05	.15	.04	.14			.06	.15	.07	.16	.07	.16	.09	.17	.08	.17	.09	.20	.09	.20	.13	.20	.13	.20					
α	.84	.82	.89	.83			.89	.85	.86	.86	.90	.88	.90	.87	.89	.86	.90	.88	.91	.90	.90	.88	.91	.88					
1. WRelQuality1																													
2. MRelQuality1	.37**																												
3. WDep1	-.39**	-.13**																											
4. MDep1	-.19**	-.40**	.20**																										
5. WRelQuality2	.61**	.35**	-.32**	-.18**																									
6. MRelQuality2	.37**	.60**	-.10*	-.32**	.39**																								
7. WDep2	-.32**	-.11**	.53**	.09*	-.45**	-.14**																							
8. MDep2	-.17**	-.31**	.17**	.51**	-.20**	-.44**	.17**																						
9. WRelQuality3	.57**	.31**	-.23**	-.20**	.65**	.39**	-.28**	-.21**																					
10. MRelQuality3	.35**	.59**	-.07	-.30**	.40**	.66**	-.13**	-.30**	.49**																				
11. WDep3	-.30**	-.09*	.47**	.10*	-.33**	-.14**	.49**	.11*	-.41**	-.16**																			
12. MDep3	-.20**	-.31**	.20**	.50**	-.17**	-.33**	.17**	.53**	-.24**	.18**																			
13. WRelQuality4	.52**	.27**	-.28**	-.20**	.62**	.31**	-.31**	-.20**	.68**	.44**	-.41**	-.26**																	
14. MRelQuality4	.30**	.56**	-.10*	-.30**	.36**	.63**	-.13**	-.34**	.42**	.74**	-.20**	-.40**	.48**																
15. WDep4	-.29**	-.03	.45**	.09*	-.33**	-.08	.44**	.09*	-.32**	-.11**	.59**	.11**	-.47**	-.21**															
16. MDep4	-.18**	-.29**	.13**	.50**	-.17**	-.32**	.12**	.48**	-.21**	-.35**	.12**	.62**	-.24**	-.48**	.14**														
17. WRelQuality5	.54**	.29**	-.25**	-.15**	.58**	.32**	-.29**	-.15**	.64**	.42**	-.32**	-.23**	.69**	.46**	-.34**	-.22**													
18. MRelQuality5	.30**	.56**	-.14**	-.31**	.36**	.58**	-.13**	-.36**	.42**	.65**	-.20**	-.42**	.43**	.73**	-.19**	-.44**	.52**												
19. WDep5	-.25**	-.05	.43**	.11*	-.28**	-.08	.42**	.12**	-.23**	-.07	.44**	.11*	-.33**	-.15**	.57**	.12**	-.46**	-.23**											
20. MDep5	-.19**	-.23**	.15**	.48**	-.17**	-.27**	.13**	.48**	-.22**	-.27**	.11**	.61**	-.22**	-.33**	.14**	.67**	-.27**	-.47**	.18**										
21. WRelQuality6	.49**	.30**	-.23**	-.13**	.57**	.34**	-.32**	-.17**	.62**	.37**	-.31**	-.21**	.62**	.39**	-.29**	-.17**	.67**	.39**	-.32**	-.21**									
22. MRelQuality6	.27**	.52**	-.06	-.20**	.34**	.55**	-.12**	-.32**	.39**	.60**	-.11*	-.31**	.37**	.60**	-.12**	-.30**	.41**	.65**	-.13**	-.34**	.51**								
23. WDep6	-.28**	-.10*	.39**	.13**	-.31**	-.13**	.50**	.17**	-.29**	-.16**	.51**	.20**	-.33**	-.20**	.50**	.14**	-.35**	-.20**	.50**	.23**	-.48**	-.27**							
24. MDep6	-.19**	-.31**	.21**	.40**	-.21**	-.32**	.20**	.45**	-.27**	-.32**	.21**	.52**	-.19**	-.35**	.13**	.52**	-.23**	-.40**	.19**	.58**	-.31**	-.49**	.27**						
25. Women age	-.02	-.04	-.10**	-.11*	.00	-.07	-.06	-.06	.00	-.13**	-.08*	-.02	-.03	-.05	-.06	-.05	-.05	-.05	-.12**	-.08	.02	.01	-.06	.01					
26. Women education	.07	.07	-.20**	-.07	.14**	-.01	-.20**	-.13**	.12**	.01	-.19**	-.09*	.05	.02	-.14**	-.09*	.07	.06	-.15**	-.16**	.10*	.02	-.21**	-.15**	.40**				
27. Men education	.10*	.13**	-.24**	-.14**	.14**	.03	-.17**	-.12**	.11**	.02	-.21**	-.14**	.08*	.04	-.17**	-.12**	.01	.08	-.17**	-.18**	.11*	.05	-.18**	-.20**	.33**	.60**			
28. Inc-to-needs ratio	.08*	.05	-.17**	-.10*	.13**	.02	-.12**	-.10*	.11**	.03	-.15**	-.09*	.08	.04	-.12**	-.06	.10*	.04	-.17**	-.10*	.12**	.07	-.16**	-.13**	.26**	.39**	.37**		

Note: \*p < .05, \*\*p < .01.

W = Women, M = Men, RelQuality = Relationship Quality; Dep = Depressive Symptoms.



Table 2

*Two Sample Comparisons of Main Study Variables across Marital Status and Women's Race*

Variables	Married - Cohabiting			Women White - Non-white		
	<i>t</i>	<i>p</i>	<i>d</i>	<i>t</i>	<i>p</i>	<i>d</i>
1. WRelQuality1	1.10	.28	0.25	0.27	.79	0.04
2. MRelQuality1	1.35	.19	0.35	0.22	.83	0.04
3. WDep1	-3.07**	.01	-0.99	-1.78 <sup>†</sup>	.08	-0.31
4. MDep1	-2.40*	.03	-0.77	-1.05	.30	-0.20
5. WRelQuality2	0.99	.33	0.22	0.28	.78	0.04
6. MRelQuality2	1.50	.15	0.28	-1.63	.11	-0.21
7. WDep2	-2.76*	.01	-0.69	-0.91	.37	-0.15
8. MDep2	-1.70	.10	-0.51	0.03	.97	0.00
9. WRelQuality3	0.55	.59	0.11	2.50*	.02	0.32
10. MRelQuality3	0.66	.51	0.12	0.75	.45	0.10
11. WDep3	-1.23	.23	0.22	-0.92	.36	-0.11
12. MDep3	-2.12*	.05	-0.65	-1.32	.19	-0.19
13. WRelQuality4	0.18	.86	0.04	0.26	.79	0.03
14. MRelQuality4	0.71	.49	0.20	1.09	.28	0.16
15. WDep4	-1.71 <sup>†</sup>	.10	-0.41	-0.76	.45	-0.09
16. MDep4	-1.80 <sup>†</sup>	.09	-0.64	-0.90	.37	-0.13
17. WRelQuality5	0.13	.90	0.03	0.53	.60	0.07
18. MRelQuality5	1.61	.12	0.45	1.44	.16	0.22
19. WDep5	-2.15*	.04	-0.48	-1.32	.19	-0.18
20. MDep5	-1.93 <sup>†</sup>	.07	-0.69	-0.86	.39	-0.12
21. WRelQuality6	-1.05	.31	-0.23	-0.66	.51	-0.09
22. MRelQuality6	0.15	.88	0.04	1.38	.17	0.2
23. WDep6	-1.56	.14	-0.43	-1.64	.11	-0.24
24. MDep6	-0.16	.88	-0.05	0.00	1.00	0.00

Note: <sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ .

W = Women, M = Men, RelQuality = Relationship Quality; Dep = Depressive Symptoms.

Table 3

*Unstandardized Path Coefficients (B), Standard Error (SE), z-test Statistics, and p-values of the Autoregressive and Cross-Lagged Effects Results of the RI-CLPM*

Predictors	Outcomes	B	SE	z	p
<i>Autoregressive actor effects (within construct)</i>					
WRelQuality (t)	WRelQuality (t + 1)	0.17***	0.04	4.58	< .001
WDep (t)	WDep (t + 1)	0.13***	0.04	3.64	< .001
MRelQuality (t)	MRelQuality (t + 1)	0.18***	0.04	4.22	< .001
MDep (t)	MDep (t + 1)	0.19**	0.06	3.44	.001
<i>Cross-lagged actor effects (between construct)</i>					
WDep (t)	WRelQuality (t + 1)	-0.01 <sup>†</sup>	0.00	-1.80	.072
WRelQuality (t)	WDep (t + 1)	-0.74**	0.27	-2.75	.006
MDep (t)	MRelQuality (t + 1)	-0.01*	0.00	-2.30	.022
MRelQuality (t)	MDep (t + 1)	-0.36	0.35	-1.02	.309
<i>Cross-lagged partner effects (within construct)</i>					
MDep (t)	WDep (t + 1)	-0.02	0.03	-0.65	.514
MRelQuality (t)	WRelQuality (t + 1)	0.12**	0.03	3.38	.001
WDep (t)	MDep (t + 1)	0.02	0.02	0.86	.393
WRelQuality (t)	MRelQuality (t + 1)	0.08**	0.03	2.80	.005
<i>Cross-lagged partner effects (between construct)</i>					
WDep (t)	MRelQuality (t + 1)	0.00	0.00	-1.54	.124
MRelQuality (t)	WDep (t + 1)	-0.61 <sup>†</sup>	0.33	-1.84	.066
MDep (t)	WRelQuality (t + 1)	0.00	0.00	-0.51	.609
WRelQuality (t)	MDep (t + 1)	-0.05	0.27	-0.17	.864

Note: <sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

W = Women, M = Men, RelQuality = Relationship Quality; Dep = Depressive Symptoms.

Table 4

*Residual Covariances of Latent Variables in the RI-CLPM*

	<i>r</i>	<i>z</i>	<i>p</i>		<i>r</i>	<i>z</i>	<i>p</i>
<i>Trait Constructs</i>							
WRelQuality with WDep	-.53***	-7.93	<.001	WRelQuality with MDep	-.30***	-5.10	<.001
MRelQuality with MDep	-.54***	-8.17	<.001	WDep with MRelQuality	-.16**	-2.73	.006
WRelQuality with MRelQuality	.55***	9.41	<.001	WDep with MDep	.21**	2.78	.005
<i>State Constructs</i>							
WDep 1 with WRelQuality 1	-.27***	-4.67	<.001	WDep 1 with MDep 1	.08	1.15	.25
WDep 2 with WRelQuality 2	-.31***	-5.86	<.001	WDep 2 with MDep 2	.08	1.56	.12
WDep 3 with WRelQuality 3	-.30***	-4.62	<.001	WDep 3 with MDep 3	.11	1.57	.12
WDep 4 with WRelQuality 4	-.32***	-4.63	<.001	WDep 4 with MDep 4	.08	1.48	.14
WDep 5 with WRelQuality 5	-.40***	-6.30	<.001	WDep 5 with MDep 5	.09	1.29	.20
WDep 6 with WRelQuality 6	-.38***	-5.33	<.001	WDep 6 with MDep 6	.13*	2.43	.02
WRelQuality 1 with MDep 1	-.05	-0.82	.41	WDep 1 with MRelQuality 1	-.10†	-1.89	.06
WRelQuality 2 with MDep 2	-.08	-1.29	.20	WDep 2 with MRelQuality 2	-.11†	-1.90	.06
WRelQuality 3 with MDep 3	-.09	-1.29	.20	WDep 3 with MRelQuality 3	-.12†	-1.70	.09
WRelQuality 4 with MDep 4	-.08	-1.21	.23	WDep 4 with MRelQuality 4	-.22***	-3.16	<.001
WRelQuality 5 with MDep 5	-.18**	-2.73	.01	WDep 5 with MRelQuality 5	-.21***	-3.11	<.001
WRelQuality 6 with MDep 6	-.21***	-4.01	<.001	WDep 6 with MRelQuality 6	-.25***	-4.49	<.001
WRelQuality 1 with MRelQuality 1	.22***	3.60	<.001	MDep 1 with MRelQuality 1	-.26***	-3.62	<.001
WRelQuality 2 with MRelQuality 2	.14*	2.36	.02	MDep 2 with MRelQuality 2	-.33***	-4.75	<.001
WRelQuality 3 with MRelQuality 3	.32***	3.88	<.001	MDep 3 with MRelQuality 3	-.28***	-3.63	<.001
WRelQuality 4 with MRelQuality 4	.30***	4.35	<.001	MDep 4 with MRelQuality 4	-.32***	-4.81	<.001
WRelQuality 5 with MRelQuality 5	.35***	5.76	<.001	MDep 5 with MRelQuality 5	-.34***	-4.94	<.001
WRelQuality 6 with MRelQuality 6	.35***	5.08	<.001	MDep 6 with MRelQuality 6	-.36***	-5.25	<.001

Note: † $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . W = Women, M = Men, RelQuality = Relationship Quality; Dep = Depressive Symptoms.

Table 5

*Unstandardized Path Coefficients (B), Standard Error (SE), z-test Statistics, and p-values of the Effects of Demographic Variables on Trait Constructs in the RI-CLPM*

	<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>		<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>
<i>Trait Women Relationship Quality</i>					<i>Trait Men Depression</i>				
Inc-to-needs ratio	0.02**	0.01	2.73	.006	Inc-to-needs ratio	-0.08 <sup>†</sup>	0.04	-1.89	.058
Women age	-0.02*	0.01	-2.19	.029	Women age	0.04	0.05	0.80	.422
Women education	0.02	0.02	1.46	.146	Women education	-0.04	0.11	-0.38	.703
Marital Status	0.02	0.16	0.13	.898	Marital Status	3.42*	1.52	2.25	.024
Men Education	0.02	0.01	1.16	.244	Men Education	-0.29**	0.09	-3.31	.001
<i>Trait Men Relationship Quality</i>					<i>Trait Women Depression</i>				
Inc-to-needs ratio	0.01	0.01	0.96	.340	Inc-to-needs ratio	-0.16**	0.06	-2.75	.006
Women age	-0.02**	0.01	-2.72	.007	Women age	0.04	0.05	0.75	.456
Women education	0.01	0.02	0.38	.707	Women education	-0.25*	0.11	-2.23	.026
Marital Status	-0.28 <sup>†</sup>	0.17	-1.66	.098	Marital Status	2.92 <sup>†</sup>	1.70	1.72	.085
Men Education	0.02	0.01	1.25	.213	Men Education	-0.32**	0.10	-3.12	.002

Note: <sup>†</sup> $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

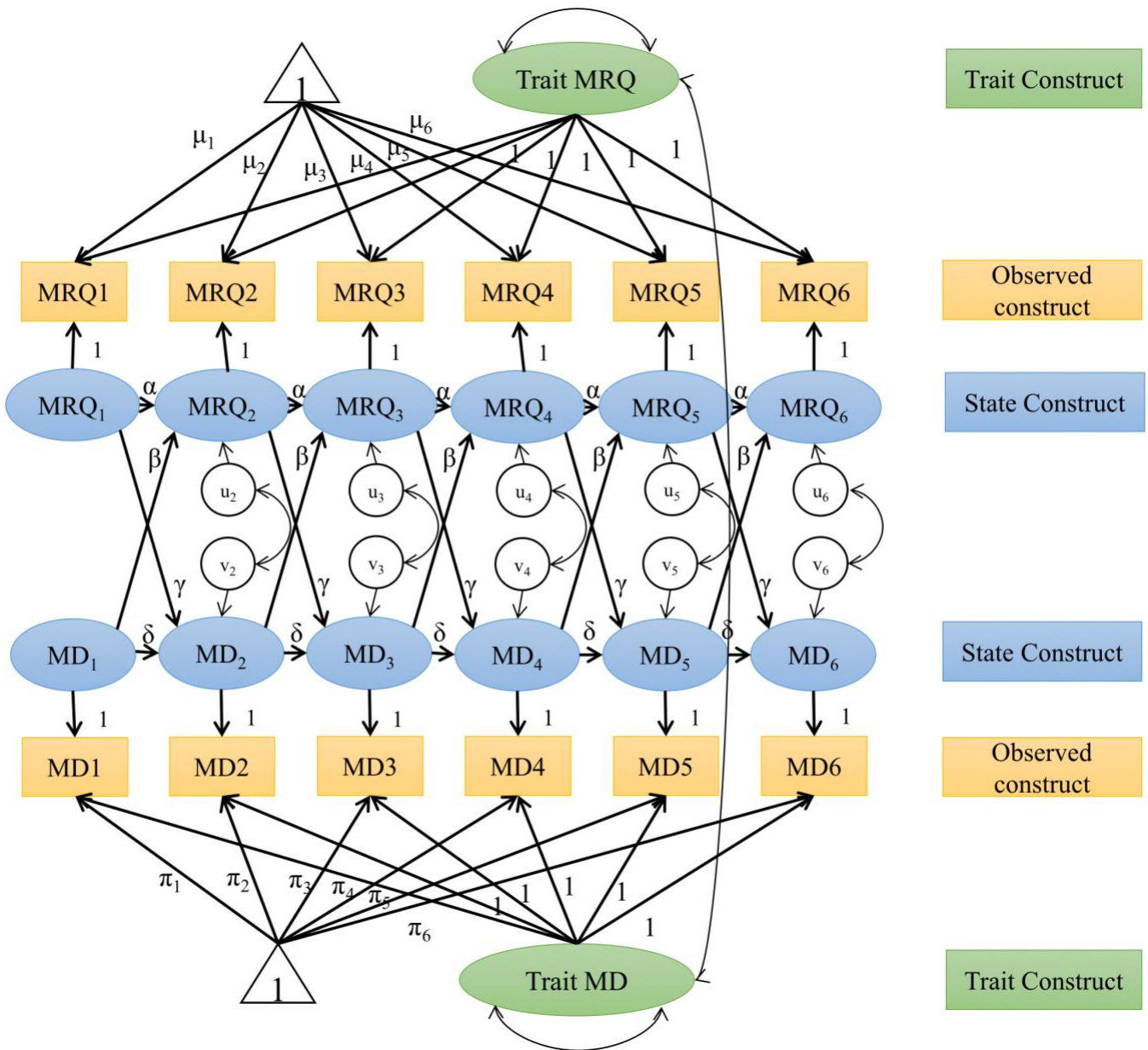


Figure 1.

Visualization of the RI-CLPM depicting the relations between two of the four studied variables—men’s relationship quality and men’s depressive symptoms—over six time points. MRQ = Men’s Relationship Quality, MD = Men’s Depressive Symptoms. Specific time points are indicated by numbers after MRQ and MD: 1 = Time 1, 2 = Time 2, 3 = Time 3, 4 = Time 4, 5 = Time 5, 6 = Time 6.

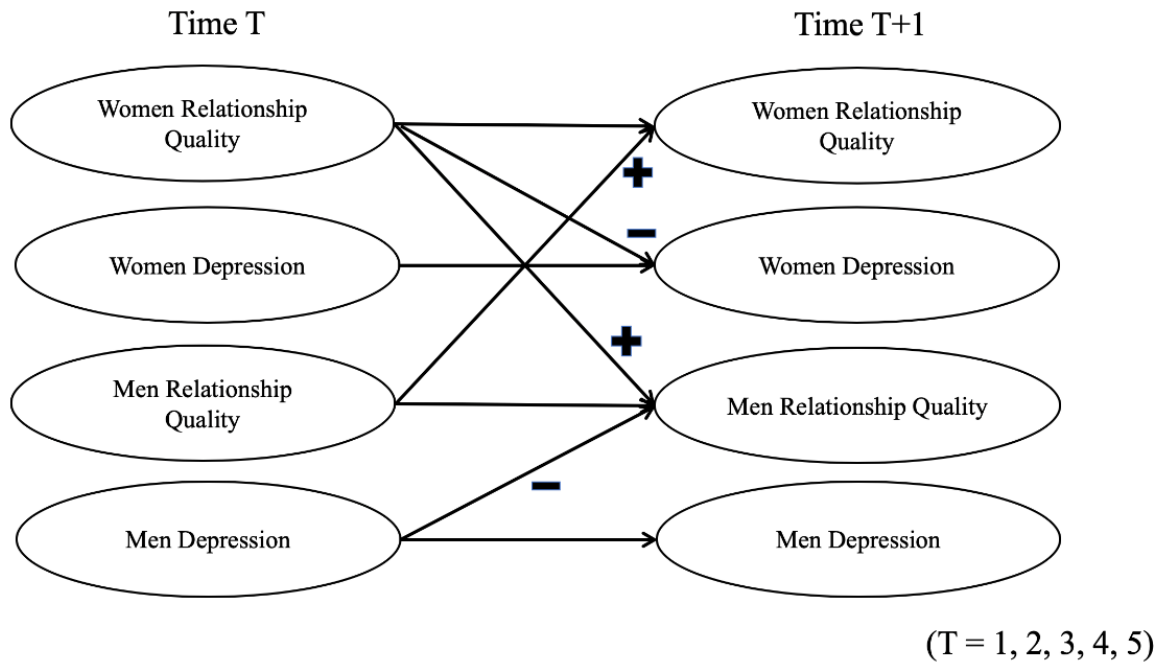


Figure 2

Visual summary of the main findings in RI-CLPM.