Transactional Relations Between Marital Functioning and Depressive Symptoms

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Abstract

The present study investigated dynamic, longitudinal associations between depressive symptoms and marital processes. Two hundred ninety-six couples reported on marital satisfaction, marital conflict, and depressive symptoms yearly for three years. Observational measures of marital conflict were also collected. Results suggested that different domains of marital functioning related to husbands' versus wives' symptoms. For husbands, transactional relations between *marital satisfaction* and depressive symptoms were identified: high levels of depressive symptoms predicted subsequent decreases in marital satisfaction, and decreased marital satisfaction predicted subsequent elevations in symptoms over time. For wives, high levels of *marital conflict* predicted subsequent elevations in symptoms over time. Cross-partner results indicated that husbands' depressive symptoms were also related to subsequent declines in wives' marital satisfaction. Results are discussed with regard to theoretical perspectives on the marital functioning-depression link and directions for future research are outlined.

Keywords

depressive symptoms; latent difference score models; marital conflict; marital satisfaction

Whereas the biological underpinnings of depression are recognized, interpersonal processes are hypothesized to play a key role in the development and maintenance of depressive symptoms (e.g., Joiner & Coyne, 1999). For example, Kendler, Gardner, and Prescott (2006) identified interpersonal difficulties, including marital problems, as a major pathway of depression for both women and men. Further, cross-sectional and two-wave studies have documented robust associations between marital satisfaction and depressive symptoms (Beach, Katz, Kim & Brody, 2003; Beach & O'Leary, 1993a; Fincham, Beach, Harold, & Osborne, 1997; Knobloch & Knobloch-Fedders, 2010; see also Rehman, Gollan, & Mortimer, 2008; Whisman, 2001). In a longitudinal study of couples in established relationships, Kouros, Papp, and Cummings (2008) found reciprocal relations between marital satisfaction and depressive symptoms over a three year period, such that depressive symptoms and marital satisfaction were negatively related over time. Davila and colleagues reported similar patterns of effects among newlywed couples (e.g., Davila, Bradbury, Cohan, & Tochluk, 1997; Davila, Karney, Hall, & Bradbury, 2003).

Although the majority of studies have focused on links between marital satisfaction and depressive symptoms, other marital processes warrant further examination (Whisman, 2001). Specifically, marital conflict is a predictor of depressive symptoms, even when controlling for marital satisfaction (Du Rocher Schudlich, Papp, & Cummings, 2004; Laurent, Kim, & Capaldi, 2009). Studies show that couples with a depressed spouse express sadder affect, lower positive verbal behavior, greater negative verbal and nonverbal

behavior, and psychological and physical complaints during marital interactions (e.g., Johnson & Jacob, 2000; Papp, Kouros, & Cummings, 2009; Ruscher & Gotlib, 1988). Using a 15-day diary methodology, Papp, Goeke-Morey, and Cummings (2007) found that spouses' psychological distress (depression and anxiety) was concurrently related to negative conflict expressions and increased negative emotions, including anger and sadness. Further, depressed individuals were more likely to withdraw during marital conflict interactions (Papp et al.), thereby decreasing the possibility for conflict resolution which may contribute to their depressive symptoms. In a two-wave study, Proulx, Buehler, and Helms (2009) found that husbands' hostile behavior during a laboratory interaction was related to higher levels of wives' depressive symptoms three years later. Wives' hostility was related to husbands' symptoms only for couples experiencing stressful life events. Laurent et al. (2009) examined longitudinal relations between marital conflict and depressive symptoms and found that couples' positive engagement and physical aggression during conflict was related to wives', but not husbands', depressive symptoms. In sum, concurrent associations between marital conflict and depressive symptoms have been consistently found; however, there is a dearth of longitudinal studies examining relations between marital conflict and depressive symptoms.

Prominent theoretical explanations for the association between depression and marital functioning imply certain directions of effects between these two processes over time. For example, Coyne's (1976) interactional theory posits transactional relations over time. That is, depressed individuals simultaneously seek reassurance and negative feedback from those close to them. These contradictory processes elicit interpersonal rejection, which in turn contributes to the depressed person's symptoms (see also Starr & Davila, 2008). The marital discord model of depression (Beach, Sandeen, & O'Leary, 1990) posits that marital dissatisfaction is a risk factor for depression because marital distress impairs spousal support and couple cohesion. The stress generation model (Hammen, 1991) argues that depressed individuals generate more stress in their lives, including interpersonal difficulties, which in turn leads to further depression. There have been few empirical tests, however, directly comparing the hypothesized relations between marital functioning and depressive symptoms proposed by these models.

These theoretical explanations are pertinent to clinical treatment approaches for depression among married couples. Karney (2001) noted that couples therapy for the treatment of depression assumes that changes in the marital relationship will yield changes in depressive symptoms, thereby suggesting a dynamic, transactional relation between these two factors. Meta-analytic reviews support couples therapy as effective for treating relationship distress (Snyder, Castellani, & Whisman, 2006). Couples therapy, especially therapies with focus on communication and problem-solving skills, may also be effective in alleviating mood disorders.

Snyder et al. (2006) stress the importance of research on change processes to complement and further advance research on the effectiveness of couples' therapy. That is, research focused on how marital processes and depressive symptoms are dynamically related over time may identify areas for more effectively targeting therapy for the treatment of both relationship distress and depressive symptoms. Understanding how these processes are related over time also has important implications for prevention efforts aimed at promoting mental health and healthy interpersonal relationships. For example, assessment of depressive symptoms or marital distress in health screenings may serve to inform the need for early intervention for one or both problems before difficulties escalate. However, although progress has been made in examining longitudinal, within-individual changes in depressive symptoms and marital satisfaction (e.g., Davila et al., 2003; Kouros et al., 2008; Prouchno, Wilson-Genderson, & Cartwright, 2009), there have been no direct tests that *simultaneously*

examine the effect marital functioning and depressive symptoms have on each other over time. That is, although such relations are posited in both theoretical and treatment perspectives, prospective investigations of the dynamic, transactional relation between depressive symptoms and multiple dimensions of marital functioning remains a gap in the literature.

Although hierarchical linear modeling (HLM) has been used to examine associations between marital functioning and depressive symptoms (e.g., Davila et al., 2003; Kouros et al., 2008; Laurent et al., 2009), this approach has limitations for testing theoretical perspectives on how depressive symptoms and marital functioning are dynamically related over time. HLM models only allow for one process to be modeled at a time; that is, either depressive symptoms or marital dissatisfaction is the outcome variable. The other variable is treated as a time-varying covariate, which does not have its own trajectory included in the model (Bollen & Curran, 2006, Ferrer & McArdle, 2010). Thus, HLM models do not address questions of how trajectories of one variable are related to trajectories in the other over time. Further, HLM models examine relations between depressive symptoms and marital functioning, *controlling for time* (Bollen & Curran, 2006; Ferrer & McArdle, 2003, 2010). In sum, past methodological approaches based on HLM are limited in testing theoretical notions of how depressive symptoms and marital satisfaction simultaneously change and simultaneously predict change in each other over time.

The current study addressed these limitations by using latent difference score (LDS) modeling (also referred to as latent change score models; McArdle & Hamagami, 2001). LDS models are an extension of HLM models, in which two growth processes are simultaneously estimated and the temporal dynamics between two processes can be estimated (i.e., longitudinal coupling). Like HLM, LDS models provide for individual variability in latent growth parameters and can be extended to test for cross-partner effects (e.g., Gerstorf, Hoppmann, Kadlec, & McArdle, 2009). Model comparisons can be used to test different hypothesized temporal relations between depressive symptoms and marital functioning. LDS and HLM models differ in their underlying model of change; LDS models can further advance the study of longitudinal relations between depressive symptoms and marital functioning (Ferrer & McArdle, 2003, 2010).

Moreover, past studies leave unclear the relation between depression and marital functioning for men as compared to woman. Wives' mental health has been *postulated* to be more closely tied to marital functioning than husbands' (Levenson, Carstensen, & Gottman, 1993). Fincham et al. (1997) found that the prospective relationship between marital satisfaction and depressive symptoms was significant for wives, but not husbands. Similarly, Laurent et al. (2009) found within-person relations between marital conflict behaviors and depressive symptoms for wives only. Davila et al. (2003) reported that depressive symptoms predicted marital satisfaction for both partners, although the association was stronger for wives. However, Beach et al. (2003) found that the association between marital quality and subsequent depressive symptoms was similar for husbands and wives. Thus, questions remain about whether the temporal dynamics between marital processes and depressive symptoms are similar for men and women.

Finally, possible transactional relations between spouses' psychological and marital distress (i.e., cross-partner effects) over time has been rarely examined. Although Knobloch & Knobloch-Feders (2010) found significant actor effects, in which one's own depressive symptoms predicted concurrent marital quality, they did not find evidence for partner effects. Pruchno et al. (2009) found significant cross-partner effects among patients with end-stage renal disease, such that spouses' depressive symptoms predicted patients' marital satisfaction. Spouses' marital satisfaction, however, did not predict patients' depressive

symptoms. Whisman and colleagues also have found that depressive symptoms significantly predicted partner marital discord both cross-sectionally (Whisman, Uebelacker, & Weinstock, 2004) and approximately two years later (Whisman & Uebelacker, 2009). Beach et al. (2003) reported significant relations between husbands and wives' marital quality and their partner's depressive symptoms one year later. Studies of dynamic relations of marital functioning and depressive symptoms, including both husbands' and wives' symptomatology and cross-partner effects, are clearly warranted to advance our understanding of the marital functioning-depression link (Davila et al., 1997).

Current Study and Hypotheses

The present study examined the transactional interplay between two dimensions of marital functioning (marital satisfaction and marital conflict) and couples' depressive symptoms over time, addressing several gaps in the extant literature. Both within-person and cross-partner effects were estimated. Specifically, changes in marital functioning were assessed in relation to changes in depressive symptoms. Previous research (e.g., Beach et al., 2003) and theory (e.g., marital discord model; Beach et al., 1990) suggest that marital dysfunction precedes depression, whereas other studies (e.g., Beach & O'Leary, 1993a) and theoretical perspectives (e.g., stress-generation theory; Hammen, 1991) posit that depression precedes marital dysfunction. Yet other theoretical perspectives (e.g., interactional model of depression; Coyne, 1976) and clinical treatments suggest a transactional relationship (i.e., longitudinal coupling), such that both marital functioning and depressive symptoms simultaneously predicted change in the other process over time. However, without prospective longitudinal research designs, findings must be interpreted with caution.

Using dynamic latent difference score modeling, these competing theories can be tested. Prior research supports that (a) depressive symptoms predict marital functioning, and (b) marital functioning predicts depressive symptoms. However, another possibility is that these relations are transactional. In this study, a transactional model was compared to a model in which only one pathway of effect was tested (marital dysfunction predicting depressive symptoms) as well as to a model in which the other pathway of effect was tested (depressive symptoms predicting marital dysfunction), in order to investigate whether one process may be leading the other. The hypothesis was that there would be a transactional relation between these two processes both within individuals and between spouses, although questions about the pattern of these relations for wives compared to husbands were exploratory in the relative absence of prior empirical investigation.

Method

Participants

Participants were 296 heterosexual couples living in a small city in the Midwest that were part of a prospective longitudinal study on family process and child development (e.g., Cummings, Goeke-Morey, & Papp, 2003; Cummings, Schermerhorn, Davies, Goeke-Morey, & Cummings, 2006; Papp, Kouros, & Cummings, 2009). Couples were recruited from the community through newspaper and radio advertisements, flyers, and through local public schools. Inclusion criteria for the larger study were that couples had been living together for at least two years ($M = 13.28$, $SD = 6.03$, range 1-40) and had a child between the ages of 8-18 ($M = 11.12$, $SD = 2.31$; 155 boys). On average, couples had 2-3 children (range 1-6). Approximately 97 % ($n = 286$) of couples were married ($M = 12.37$ years, $SD = 6.60$; years living together: $M = 13.53$, $SD = 5.93$) and the remaining 3.4 % ($n = 10$) were cohabiting. Two cohabiting couples married during the study period. Non-married cohabiting couples had been living together on average for 6 years ($SD = 4.41$) and were in established relationships; therefore, they were included in analyses (e.g., Whisman et al.,

2004). We use the terms "husbands", "wives", and "married couples" in the present study for the sake of ease of communication and reflecting the status of the great majority of the couples. The racial composition of the sample was 87 % European-American, 8.5 % African-American, 1 % Hispanic, and the remaining 3.5 % were biracial. The median household income was $40,000 to $65,000.

Of the 296 couples who participated at Time 1, 31 couples dropped from the study because they were too busy ($n = 11$), had moved away or could not be contacted ($n = 9$), had divorced ($n = 5$), or were no longer interested in participating ($n = 6$). Of the 265 families that participated at Time 2, 17 did not return at Time 3, indicating they were too busy to participate ($n = 10$), no longer in a relationship with their partner ($n = 3$), had moved ($n = 1$), or were no longer interested in participating ($n = 3$). All available data from all couples were used in analyses.

Procedures

Each year, for three years, couples came to the university laboratory, which was decorated to look like a living room in a home, to complete measures. Participants provided informed consent, and the study procedures met the approval of the institutional review board for the protection of human subjects. Couples independently completed several questionnaires about their own depressive symptoms and marital relationship, and engaged in a video-taped problem solving discussion designed to examine marital conflict in a laboratory setting. Spouses were asked to separately list three topics of disagreement they felt they handled well as a couple. Together, couples chose one topic from either of their lists that they both felt comfortable discussing in the laboratory. Couples were instructed to talk about a specific issue within their topic, either something that occurred often or had come up recently, for seven and a half minutes, and work toward a resolution. The interactions were videotaped with a hidden camera system. Families received monetary compensation for participating in the study: $100 at Time 1, $120 at Time 2, and $140 at Time 3; a subset of families were paid $200 at Time 2 and 3 for completing additional measures and tasks.

Measures

Depressive symptoms—Depressive symptoms were measured using the Depression subscale of the Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1994). Participants rated how much a list of 13 problems (e.g., feeling blue, feeling hopeless about the future) had bothered or distressed them during the past week on a scale ranging from 0 (*not at all*) to 4 (*extremely*). Items were averaged and higher scores reflected higher levels of depressive symptoms. For example, average scores of .52 and .76 for males and females, respectively, indicate potentially borderline-clinical levels of depression (i.e., T-score = 60). The Depression subscale is appropriate for use with community samples and has high construct, convergent and discriminate validity, and acceptable test-retest reliability (.82; Derogatis, 1994). In this sample, the reliability of this scale was excellent for both husbands' (Cronbach's α = .88, .85, .86) and wives' (Cronbach's α = .91, .89, .89) reports across all three occasions of measurement.

Marital functioning—Two separate dimensions of marital functioning were examined: (a) marital satisfaction/distress, and (b) marital conflict.

Marital satisfaction—Husbands and wives provided self-reports of their marital satisfaction on the Marital Adjustment Test (MAT; Locke & Wallace, 1959). This questionnaire contains 15 items (e.g., "Do you ever wish you had not married?" rated on a 4-point scale from *frequently* to *never*). Higher scores reflect greater satisfaction and a more well-adjusted marital relationship and scores below 100 reflect marital distress. The MAT

has demonstrated good psychometric properties, including good concurrent and predictive validity (Locke & Wallace). The average reliability of this measure for husbands' and wives' reports across time were .73 (range = .70 - .75) and .78 (range = .77-.80), respectively.

Notably, the MAT has been criticized for confounding communication/conflict items with satisfaction. Based on item-response theory, Funk and Rogge (2007) found that the first item of the MAT provides a high amount of information for assessing relationship satisfaction. The MAT total score was used in all analyses; however, follow-up analyses were also conducted using only the first item of the MAT as a measure of satisfaction (e.g., Doss, Rhoades, Stanley, & Markman, 2009). This item asks participants to rate the "degree of happiness, everything considered, of your present marriage" on a 7-point scale ranging from *very unhappy* to *perfectly happy*. The pattern of results obtained using the first item was the same as when the MAT total score were used (available upon request).

Marital conflict—Multiple methods and reporters of marital conflict were used: (a) husbands and wives provided self-reports with the O'Leary Porter Scale (OPS; Porter & O'Leary, 1980), and (b) couples' videotaped interactions were coded to provide observer ratings of conflict. On the OPS, husbands and wives rated the frequency of occurrence of conflict scenarios (9 items; e.g., how often is there a physical expression of hostility between you and your spouse in front of your child) on a scale ranging from 0 (*never*) to 4 (*very often*). Items were summed to create a conflict score, with higher scores reflecting increased levels of overt hostility. Cronbach's αs for wives' (.77, .74. .83) and husbands' (.76, .81, .82) reports on the OPS at the three time points were good.

The videotaped conflict resolution task described above was coded using an adaptation of Mangelsdorf and colleagues' marital behavior coding system (Frosch, Mangelsdorf, & McHale, 1998). Undergraduate research assistants received extensive training by an advanced graduate student. Each videotaped interaction was coded once by one of the research assistants. Twelve dimensions of marital conflict were coded on a scale ranging from 1 (*very low*) to 7 (*very high*). The scales (with the average intra-class correlation coefficient presented in parentheses) were: Engagement/Interpersonal Involvement (.72), Fun/Enjoyment (.83), Wife Positive Affect (.78), Husband Positive Affect (.78), Irritation/ Antagonism (.86), Wife Negative Affect (.86), Husband Negative Affect (.64), Cooperation/ Joint Task Involvement (.75), Balance/Reciprocity (.60), Global Rating of Interaction Quality (.81), Sensitivity/Support (.81), and Conflict Resolution/Satisfaction (.79) (see Frosch et al., 1998 for specific definitions and examples of each subscale). These scales were used to create two composites of marital conflict reflecting positive engagement and negative engagement (Frosch et al., 1998).

The negative engagement composite was used in the current study and was created by summing scores for irritation, wife negative affect, husband negative affect, and then subtracting scores for sensitivity, conflict resolution, cooperation, and global quality of the interaction. Cronbach's alpha for this composite was .89, .90, and .86 for Time 1 to Time 3. A *marital conflict composite* that included both self and observer ratings was created by standardizing and summing husbands' and wives' OPS scores, and the negative engagement composite.

Results

Means, standard deviations, and intercorrelations among the study variables are presented in Table 1. At each time point, depressive symptoms were negatively related to marital satisfaction, and were positively related to marital conflict. According to the SCL-90-R,

wives' mean level of depressive symptoms was higher as compared to husbands at all three time points [Time1: $t(272) = 3.99$, $p < .01$; Time 2: $t(246) = 4.75$, $p < .01$; Time 3: $t(236) = 4.50$, $p < .01$]. At Time 1, 28.7 % wives and 24.7 % husbands were above the cut-off scores on the SCL-90-R, suggesting potentially clinical levels of depression. With regard to marital satisfaction, 26.7% of wives and 28.7% of husbands reported marital distress (MAT score < 100) at Time 1. There were 40 couples (13.5 %) at Time 1 in which both spouses reported marital distress. Dependent t-tests indicated no significant differences between husbands' and wives' reports of marital distress at any of the three time points. There was also no significant difference between husbands' and wives' reports of marital conflict on the OPS.

Analysis Plan

Latent difference score structural equation analyses (LDS; McArdle & Hamagami, 2001) were used in order to model the dynamic interplay between marital functioning (satisfaction and conflict) and spouses' depressive symptoms. Models were fit using the AMOS 16.0 (Arbuckle & Wothke, 1999) statistical package, which uses full information maximum likelihood estimation to handle missing data. We included length of couple cohabitation as a covariate in all analyses to account for the range in relationship length in this study, as well as account for changes in depressive symptoms and marital functioning that may simply be due to how long couples have been together (e.g., Beach & O'Leary, 1993b; Kurdek, 1999).

Univariate LDS models—Models in which one change process was examined, referred to as dynamic *univariate* latent difference score models, were first tested. As a first step to building the LDS model, observed scores are partitioned into true scores (i.e., latent scores) and measurement error. One's true score on a variable at a given time point is then indicated by their previous true score on that measure. The residual in the true score, therefore, is the change in that variable and is represented as a latent variable (i.e., latent difference score). Change in these latent difference scores can be modeled in several ways.

In the current study, we first examined latent change separately for depressive symptoms and marital functioning (satisfaction and conflict, respectively) by testing and comparing four types of univariate latent difference score models, controlling for length of couple cohabitation. Tests of univariate models are recommended as a first-step to allow for the most parsimonious models of change in further analyses of the bivariate associations between marital functioning and depressive symptoms (McArdle & Hamagami, 2001; see also Hawley, Ho, Zuroff, & Blatt, 2006 for example). The models tested were: (a) no change, (b) constant change, (c) proportional change, and (d) dual change. The no change model assumes that latent scores did not change over time; that is, each score is perfectly predicted by their previous score on that variable. The constant change model predicts that latent change occurs at a constant rate; therefore, an intercept (I) and slope (S) parameter (i.e., additive coefficient) were used to model ones' change. Typically the α parameter is set to one for identification purposes and corresponds to a linear growth curve model (i.e., constant unit increase over time). In the proportional change model, latent change is proportional to the latent score from the previous time point: only a time-invariant proportional coefficient, β, was used to model change. The dual change model incorporated both the constant change and proportional change models: latent change was modeled as a function of a constant slope plus some proportion of one's previous latent score. The Akaike Information Criterion (AIC), a goodness-of-fit measure which takes into account model complexity, was used to compare the four models. A lower AIC indicates a better fitting model.

Bivariate LDS models—Using the best fitting univariate models for each process, we tested for dynamic, transactional relations between depressive symptoms and marital

functioning by fitting *bivariate* dynamic latent difference score models (McArdle & Hamagami, 2001; see also Hawley et al., 2006 for application of LDS models). An example of a dynamic bivariate latent difference score model examining transactional relations between depressive symptoms and marital satisfaction is presented in Figure 1. The important aspects of this model for the current study are that two growth processes are represented and there is the addition of coupling parameters (γ_{sym} and γ_{sat}), which assess dynamic, transactional relations between these two processes (i.e., longitudinal coupling). The model includes latent variables of individuals' intercepts and slopes of depressive symptoms and marital satisfaction. Each of these variables has a mean and variance, representing the average growth trajectory for participants and the variability in these trajectories. Participants' latent difference score (i.e., latent change) of depressive symptoms at time t (ΔScore) is modeled as a function of a constant slope (α; set equal to 1), some proportion of their previous symptoms (β_{sym}), and some proportion of their previous marital satisfaction (γ_{sat}). Similarly, participants' latent difference score of marital satisfaction at time t is modeled as a function of a constant slope (α), some proportion of their previous satisfaction (β_{sat}), and some proportion of their previous depressive symptoms (γ_{sym}).

Model comparison—Four competing models were tested for each marital process (satisfaction and conflict). The base model was a *transactional model* as depicted in Figure 1, in which both depressive symptoms and marital functioning simultaneously predicted latent change in the other process. This model was then compared to a (a) *satisfaction/ conflict → symptoms* model, which allowed for only one unidirectional time-invariant coupling parameter between depressive symptoms and marital functioning, such that levels of marital functioning (satisfaction or conflict) predicted subsequent change in depressive symptoms (i.e., $\gamma_{sat} = 0$); (b) *symptoms → satisfaction/conflict* model, which allowed for only one unidirectional time-invariant coupling parameter, such that levels of depressive symptoms predicted subsequent change in marital functioning (satisfaction or conflict) over time (i.e., $\gamma_{sym} = 0$), and (c) *no coupling* model in which change in depressive symptoms and marital processes were simultaneously modeled; however, depressive symptoms and marital functioning did not predict latent change in the other variable over time (i.e., $\gamma_{sat} = 0$ and $\gamma_{sym} = 0$).

Preliminary Analyses: Univariate Dynamic LDS Models

As a first step, the four univariate LDS models described earlier were fit to each study variable, controlling for length of couple cohabitation. Overall, for depressive symptoms and marital satisfaction, the no change and proportional change models provided poor fits to the data (e.g., χ^2/df range = 228.40 - 1603.20). With regard to *depressive symptoms*, the dual change model provided the best fit to the sample data, with the lowest AIC, for both husbands and wives (25.32 and 23.22, respectively) compared to the constant change (AICs = 25.85 and 29.14) model. For *marital satisfaction*, the constant change model provided the best fit for both husbands and wives (AICs = 22.72 and 25.53, respectively) compared to the dual change (23.67 and 26.91) model. In contrast, the proportional change model was the best fitting model for change in *marital conflict* (AIC = 21.95) compared to the other change models (no change = 514.51, constant change = 24.98, and dual change = 26.85).

Dynamic relations between one's own marital functioning and depressive symptoms

Bivariate LDS models were fit examining (a) the dynamic association between depressive symptoms and marital conflict and (b) the dynamic association between depressive symptoms and marital satisfaction. These analyses were conducted separately for husbands and wives, and controlled for length of couple cohabitation.

Marital conflict and depressive symptoms—The bivariate LDS model examining transactional relations between depressive symptoms and marital conflict for wives provided a good fit to the sample data, χ^2 (18, N = 296) = 51.68, χ^2/df = 2.87, CFI = .96, NFI = .94, RMSEA = .08, AIC = 85.68. Although the *transactional* model provided a better fit to the sample data compared to the *no coupling* [AIC = 86.59, $\Delta\chi^2$ (1, N = 296) = 4.91, p < .05], and *symptoms* → *conflict* [AIC = 88.01, $\Delta\chi^2$ (1, N = 296) = 4.33, p < .05] models, it did not provide a significantly better fit than the *conflict* → *symptoms* model, $\Delta\chi^2$ (1, N = 296) = 0.24.

Thus, for wives the best fitting and most parsimonious model was the *conflict* → *symptoms* model. Parameter estimates and model fit indices for this model are presented in Table 2. There was a significant positive coupling effect, γ = .02, p < .05, such that high levels of marital conflict predicted subsequent increases in depressive symptoms over time. Therefore, for the average wife (with regard to her level of depressive symptoms at Time 1), her symptoms were expected to increase by 1.43 points on the SCL-90-R over a 3-year period when levels of marital conflict were high (1 *SD*). In contrast, when levels of marital conflict were low (scores 1 *SD*), wives' depressive symptom scores were expected to decrease by .02 points. Further, there was significant variability in the slope parameter, indicating that accounting for one's previous level of symptoms and marital conflict, there remained significant individual variability in wives' systematic change in symptoms over time.

Reflecting the lack of support for this transactional pathway for husbands, the *no coupling* model provided the most parsimonious fit to the sample data. That is, although the *transactional* model provided a good fit to the sample data, [χ^2 (18, N = 296) = 40.10, χ^2/df = 2.23, CFI = .97, NFI = .95, RMSEA = .07, AIC = 74.10], it did not provide a significantly better fit compared to the *no coupling* [$\Delta\chi^2$ (1, N = 296) = 1.71], *symptoms* → *conflict* [$\Delta\chi^2$ (1, N = 296) = 0.42], or *conflict* → *symptoms* [$\Delta\chi^2$ (1, N = 296) = 1.08] models. Parameter estimates and model fit indices of the *no coupling* model are presented in Table 2. Results indicated that husbands' previous level of symptoms predicted subsequent declines in their depressive symptoms over time, b = -.22, *SE* = .05, p < .05. Additionally, there was significant individual variability in husbands' systematic change in depressive symptoms over time.

Marital satisfaction and depressive symptoms—For husbands, the *transactional* model provided a good fit to the sample data, and provided a significantly better fit compared to the *satisfaction* → *symptoms* [AIC = 55.95, $\Delta\chi^2$ (1, N = 296) = 4.13, p < .05], *symptoms* → *satisfaction* [AIC = 55.73, $\Delta\chi^2$ (1, N = 296) = 3.91, p < .05], and the *no coupling* [AIC = 56.82, $\Delta\chi^2$ (1, N = 296) = 7.00, p < .01] models. Parameter estimates and model fit indices from the *transactional* model are presented in Table 3. Significant coupling parameters were found for both the effect of depressive symptoms on subsequent latent change in marital satisfaction, and for the effect of marital satisfaction on subsequent latent change in depressive symptoms. These results indicate that, on average, depressive symptoms increased over time (i.e., slope = .26, p < .05); however being maritally satisfied slowed down this process (coupling parameter, γ_{sym} = -.002, p < .05). Similarly, the significant negative coupling coefficient predicting latent change in marital satisfaction from depressive symptoms, γ = -4.05, p < .05, indicated that higher levels of depressive symptoms predicted subsequent decreases in marital satisfaction over time.

By contrast, for wives, the most parsimonious model for the association between wives' marital satisfaction and their depressive symptoms was the *no coupling* model, indicating a lack of support for transactional relations. That is, the *transactional* model [χ^2 (13, N = 296) = 20.40, χ^2/df = 1.56, CFI = .99, NFI = .98, RMSEA = .04] did not provide a significantly

better fit to the data compared to the *no coupling* [$\Delta\chi^2$ (1, N = 296) = 0.52], *symptoms → conflict* [$\Delta\chi^2$ (1, N = 296) = 0.30], or *conflict → symptoms* [$\Delta\chi^2$ (1, N = 296) = 0.28] models. Parameter estimates and model fit indices of the *no coupling* model are presented in Table 3.

Cross-Partner Effects: Transactional relations between Spouses' Marital Satisfaction and Depressive Symptoms

Two sets of analyses were conducted examining the dynamic association between (a) wives' marital satisfaction and husbands' depressive symptoms and (b) husbands' marital satisfaction and wives' depressive symptoms. Because conflict was measured at the couple-level, cross-spouse effects between conflict and depressive symptoms were not possible.

Wives' marital satisfaction and husbands' depressive symptoms—A bivariate LDS model was fit testing the transactional relation between wives' marital satisfaction and husbands' depressive symptoms. These analyses controlled for husbands' average marital satisfaction, wives' average depressive symptoms, and length of couple cohabitation. Therefore, change in husbands' depressive symptoms was predicted by their wives' marital satisfaction, controlling for their own marital satisfaction, their wives' depressive symptoms, and length of couple cohabitation. At the same time, change in wives' marital satisfaction was predicted by their husbands' depressive symptoms, controlling for their own depressive symptoms, their husbands' marital satisfaction, and length of couple cohabitation.

The *transactional* model provided a good fit to the sample data, χ^2 (15, N = 296) = 12.40, χ^2/df = 0.83, CFI = 1.00, NFI = .99, RMSEA = .00, and provided a better fit compared to the *Wife satisfaction → Husband symptoms* [$\Delta\chi^2$ (1, N = 296) = 4.42] and the *no coupling* [$\Delta\chi^2$ (1, N = 296) = 7.35] model. The transactional model, however, did not significantly differ from the *Husband symptoms → Wife satisfaction* model [$\Delta\chi^2$ (1, N = 296) = 2.77], which also provided a good fit to the sample data and is a more parsimonious model, χ^2 (16, N = 296) = 15.17, χ^2/df = 0.95, CFI = 1.00, NFI = .99, RMSEA = .00. Parameter estimates from the *Husband symptoms → Wife satisfaction* model indicated that controlling for husbands' marital satisfaction and wives' depressive symptoms, husbands' symptoms uniquely predicted subsequent declines in wives' marital satisfaction over time, γ = -5.71 (SE = 2.78), p < .05.

Husbands' marital satisfaction and wives' depressive symptoms—A bivariate LDS model was fit testing the transactional relation between husbands' marital satisfaction and wives' depressive symptoms, controlling for husbands' depressive symptoms, wives' marital satisfaction, and length of couple cohabitation. Although, the transactional model provided a good fit to the sample data [χ^2 (15, N = 296) = 13.86, χ^2/df = 0.92, CFI = 1.00, NFI = .99, RMSEA = .00], this model did not provide a significantly better fit compared to the *no coupling* [$\Delta\chi^2$ (1, N = 296) = 0.70], *Wife symptoms → Husband satisfaction* [$\Delta\chi^2$ (1, N = 296) = 0.02], or *Husband satisfaction → Wife symptoms* [$\Delta\chi^2$ (1, N = 296) = 0.52] models. Thus, support for cross-partner effects between husbands' marital satisfaction and wives' depressive symptoms was not found.

Discussion

The primary goal of the current study was to examine the longitudinal, transactional relations between depressive symptoms and two dimensions of marital functioning (namely, satisfaction and conflict). Theoretical models have posited a specific temporal order in the relations between depressive symptoms and marital functioning, and therapeutic approaches for marital and psychological distress assume a dynamic association in which these two

processes influence change in each other over time. However, longitudinal studies and tests of these proposed models have remained a gap in this area. The present study advances our understanding of the association between marital and psychological distress by directly testing the *simultaneous* effect each of these processes has on change in the other over time. Additionally, this study included transactional relations between depressive symptoms and marital conflict, which has received less attention in the literature.

Evidence was found for associations between marital processes and depressive symptoms for both husbands and wives. However, differences between husbands and wives were discovered with regard to which domain of marital functioning was related to their depressive symptoms. For husbands, their *marital satisfaction* and depressive symptoms were dynamically related, such that depressive symptoms increased at a slower rate when husbands had high levels of satisfaction. This suggests that high levels of marital satisfaction may serve as a protective mechanism for husbands with regard to depression. At the same time, low levels of depressive symptoms were related to subsequent elevations in marital satisfaction over time. Moreover, cross-partner analyses revealed that husbands' symptoms were also related to their wives' marital satisfaction over time. For wives, *marital conflict* and their symptoms were related, such that high levels of marital conflict predicted subsequent elevations in wives' symptoms over time.

These findings are consistent with previous research which has reported an inverse association between marital functioning and depression (e.g., Davila et al., 2003; Kouros et al., 2008). For example, Davila et al. (2003) examined within-individual changes in marital satisfaction and depressive symptoms and found that lower levels of marital satisfaction were related to higher levels of depressive symptoms over the first four years of marriage. In separate analyses, higher levels of depressive symptoms were related to lower levels of satisfaction over time. The current study extended this work by simultaneously examining how changes in marital functioning and depressive symptoms are related to the other process over time. The findings demonstrate that trajectories of marital functioning and depressive symptoms are not separate but related processes. Rather, there may be a transactional relation such that the way marital processes change over time predicts change in one's symptoms and vice versa. The findings, therefore, underscore the importance of considering mutual influences between marital functioning and depressive symptoms in theoretical models, as well as allowing for the possibility that the nature of relations may differ for men and women. Moreover, given the relatively low levels of depression in this sample, the results highlight that depressive symptoms do not need to reach clinical levels to predict impairments in interpersonal relationships and underscore the importance of examining subsyndromal levels of depression among married couples.

Taken together, the results suggest that marital functioning is important for both husbands' and wives' mental health; however, different dimensions of marital functioning may be more salient for husbands' versus wives' symptoms. Gender differences in the association between marital processes and depressive symptoms have been inconsistent in this literature. For example, whereas Whisman (2001) found a stronger negative correlation between marital quality and depressive symptoms for wives compared to husbands, Fincham et al. (1997) found that depressive symptoms were a stronger predictor of marital satisfaction 18 months later for husbands compared to wives. Moreover, some studies have reported no gender differences (e.g., Beach et al., 2003). Understanding potential differences in the etiology, course, and processes underlying psychopathology among men and woman is particularly important given recent attention on depression in men (e.g., Rochlen, Whilde, & Hoyer, 2005), and is needed to further inform treatment and prevention efforts. For example, the results support the utility of couples therapy for the treatment of relationship distress and depressive symptoms; however, therapies focusing on different dimensions of relationship

distress (e.g., problem solving skills, enhancing emotional support provided by spouses), may be more beneficial for one spouse than the other. Ultimately, couples therapy should be tailored to meet the needs of both spouses.

The finding that marital conflict was related to wives', but not husbands', depressive symptoms is consistent with previous cross-sectional research that found a significant concurrent relation between wives' symptoms and use of destructive conflict expressions (e.g., Du Rocher Schudlich et al., 2004). It is also consistent with longitudinal studies that found within-individual associations between dyadic positive engagement and physical aggression during conflict for wives, but not husbands (Laurent et al., 2009). Some theories have argued that, compared to men, women's self representations develop in the context of the interactional course of interpersonal relationships (e.g., Cross & Madson, 1997). One possible explanation for why marital conflict, and not marital satisfaction, is related to wives' depressive symptoms may be because wives may interpret marital conflict as representing interactional evidence of marital problems, as compared to their perceptions of marital distress. Additionally, diary studies suggest that woman may more closely track marital discussions than husbands. For example, Cummings et al. (2003) had mothers and fathers separately complete a diary checklist after each conflict interaction during a 15-day period and found that mothers completed substantially more diaries compared to fathers. The effects of marital conflict on men's depressive symptoms may depend on other contextual factors, such as stressful life events (Proulx et al., 2009), which is perhaps why associations were not found in the current study.

This study did not find relations between wives' depressive symptoms and marital satisfaction, which is surprising given previous studies which have documented this robust association. However, it should be noted that wives' symptoms and satisfaction were concurrently related, consistent with previous studies. Also, the results from cross-partner analyses revealed that change in wives' marital satisfaction was predict by her husbands' level of depressive symptoms. Given husbands' depressive symptoms predicted change in both their own and their wives' marital satisfaction, assessing men's level of depression for couples seeking marital therapy may be particularly useful for effective treatment outcomes.

There were several limitations of the current study. First, only self-report questionnaires of depressive symptoms and marital satisfaction were used. This is problematic because (a) mono-reporter bias may have contributed to some of the within-person findings, and (b) semi-structured interviews may better capture these psychological processes. Second, marital conflict was assessed at the couple-level in the current study; therefore true within-person effects (i.e., how one's own behavior during conflict is related to his/her symptoms) or cross-partner effects (i.e., how one's spouse's behavior during conflict is related his/her symptoms) between conflict and depressive symptoms were not possible. Nevertheless, marital conflict is a dyadic process and spouses' individual behavior is likely in response to their partners' behavior. Studies assessing conflict at the dyadic level, however, would be complemented by studies that also take a more micro-analytic approach to measuring marital conflict. Third, marital processes and depressive symptoms may be more tightly coupled than shown given the annual assessments conducted in this study. Daily diary methodologies, or more frequent assessments, may be better suited for examining transactional relations between marital processes and spouses' mental health. Fourth, the sample was relatively high functioning, with regard to marital satisfaction, conflict, and depressive symptoms. The associations found may differ for couples experiencing clinical levels of depression or marital distress (e.g., physical violence). Also, our sample included couples in established relationships with at least one child, and results may differ for couples without children. Similarly, our sample was predominantly European-American, limiting the generalizability of our findings.

Fifth, although the pattern of results differed for husbands and wives, suggesting interesting gender differences with regard to which domains of marital functioning may be more salient for men's vs. women's mental health, direct tests between husbands' and wives' models was not possible. These differences, therefore, should be interpreted with caution. Whereas this is a limitation of the analytic technique used, the results from dynamic factor models contribute to the literature by directly comparing models that allow for different temporal dynamics between marital functioning and depressive symptoms over time. Sixth, support for dynamic associations between marital functioning and depressive symptoms were found; however, the processes involved in these longitudinal linkages were not examined. Moreover, despite the longitudinal design, the data were still correlational in nature. The possibility remains that a third variable not measured in this study (e.g., economic stress) may have accounted for the observed relations.

With regard to prevention efforts with community samples, the findings provide preliminary support that efforts targeted toward enhancing mental health can have an added benefit of promoting healthy relationships among married adults. Additionally, programs aimed at preventing marital problems may also serve to improve married adults' mental health. For example, brief mental health or relationship satisfaction screenings could be included as part of one's yearly medical exam to identify individuals and/or couples in need of early intervention before problems develop or worsen. Efforts targeted toward males may be especially important given the impact of husbands' mental health for both their own and their wives' marital satisfaction. Education classes that emphasize constructive ways for handling everyday marital disagreements could be offered not only as part of premarital education programs, but also in the community for couples in established relationships (Cummings, Faircloth, Mitchell, Cummings & Schermerhorn, 2008) .

To further advance this area of study, future research should aim to understand the generative mechanisms linking marital functioning and mental health. For example, some of the processes that have been implicated in the link between marital functioning and depressive symptoms include reassurance seeking, lack of spousal support, negative partner attributions, and partner criticism. Tests of these potential mediating processes will better inform treatment and prevention efforts for marital and psychological distress (Snyder et al., 2006). Understanding how and why depressive symptoms and marital quality are linked over time will provide various points of entry for preventing and treating marital dysfunction and depression. Equally important is examining moderating processes to identify which couples may be particularly vulnerable to developing a negative cycle of marital distress and psychopathology. Given the complex associations between marital functioning and psychopathology among spouses, greater understanding of how and why these processes are related over time remains an important direction for future research.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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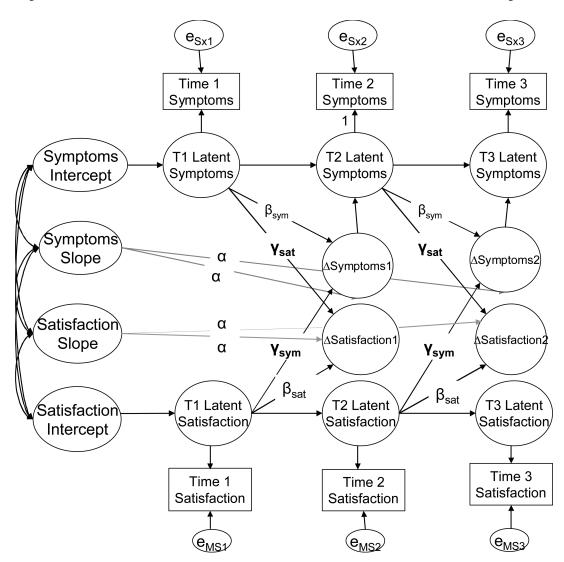
Figure 1.
Example of a bivariate dynamic latent difference score model examining the transactional relation between depressive symptoms and marital satisfaction.

Note. Sym and Sx= depressive symptoms. Sat and MS = marital satisfaction. *ΔSymptoms (Satisfaction) 1* represents latent change score from Time 1 to Time 2 and *ΔSymptoms (Satisfaction) 2* represents the latent change from Time 2 to Time 3; β represents a time-invariant proportional coefficient (i.e., proportion of previous score that predicts subsequent difference score), γ represents a time-invariant coupling parameter (i.e., proportion of score on another variable that predicts subsequent difference score). For identification purposes, α set to 1, which corresponds to linear systematic growth. Unlabeled one-headed arrow paths set to 1. Covariances between satisfaction and symptom error variances within the same time point (set equal across time) were estimated but not depicted in the figure.

Table 1

Means, Standard Deviations, and Intercorrelations among Marital Functioning and Depressive Symptom Variables

	M (SD)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
Covariate																	
1. Years living together (at Time 1)	13.22 (6.02)	--															
Time 1																	
2. Wife Depressive Symptoms: SCL-90-R	.64 (.63)	-.07	--														
3. Husband Depressive Symptoms: SCL-90-R	.45 (.48)	.02	.17**	--													
4. Wife Marital Satisfaction: MAT	112.09 (25.31)	.05	-.41**	-.20	--												
5. Husband Marital Satisfaction: MAT	109.60 (22.78)	.01	-.22**	-.34**	.51**	--											
6. Marital Conflict[a]	0.00 (2.29)	.05	.31**	.32**	-.52**	-.51**	--										
Time 2																	
7. Wife Depressive Symptoms: SCL-90-R	.60 (.61)	-.03	.75**	.19**	-.33**	-.18**	.27**	--									
8. Husband Depressive Symptoms: SCL-90-R	.41 (.39)	-.01	.12†	.62**	-.15*	-.30**	.19**	.25**	--								
9. Wife Marital Satisfaction: MAT	108.29 (26.59)	.01	-.34**	-.16*	.76**	.41**	-.49**	-.41**	-.20	--							
10. Husband Marital Satisfaction: MAT	110.80 (23.50)	.04	-.19**	-.25**	.43**	.73**	-.43**	-.21**	-.38**	.48**	--						
11. Marital Conflict[a]	0.00 (2.32)	.11†	.26**	.27**	-.47**	-.43**	.78**	.30**	.31**	-.57**	-.55**	--					
Time 3																	
12. Wife Depressive Symptoms: SCL-90-R	.57 (.55)	-.12†	.54**	.17*	-.31**	-.15*	.00	.60**	.10	-.24**	-.07	.03	--				
13. Husband Depressive Symptoms: SCL-90-R	.38 (.42)	.04	.05	.53**	-.10	-.29**	.16*	.16*	.59**	-.07	-.21**	.14*	.19**	--			
14. Wife Marital Satisfaction: MAT	104.61 (29.85)	.10	-.24**	-.19**	.70**	.43**	-.46**	-.31**	-.08	.74**	.39**	-.43**	-.38**	-.18**	--		
15. Husband Marital Satisfaction: MAT	108.38 (24.73)	.02	-.14*	-.28**	.49**	.72**	-.40**	-.15*	-.32**	.45**	.73**	-.39**	-.21**	-.34**	.54**	--	
16. Marital Conflict[a]	0.00 (2.25)	.08	.21**	.23**	-.48**	-.42**	.74**	.24**	.22**	-.52**	-.44**	.79**	.22**	.22**	-.55**	-.50**	--

Note. Time 1: $N = 296$, Time 2: $N = 265$, Time 3: $N = 248$. SCL-90-R = Symptom Checklist 90-Revised, MAT= Marital Adjustment Test.

[†]
$p < .10$.

[*]
$p < .05$.

[**]
$p < .01$.

[a]Marital conflict = composite of husband and wife OPS scores and observer rating of conflict.

Table 2

Results from Bivariate Latent Difference Score Models of the Association between Marital Conflict and Depressive Symptoms

Parameter Estimates	Wives: Conflict → Symptoms Model		Husbands: No Coupling Model	
	Conflict	Depressive Symptoms	Conflict	Depressive Symptoms
Initial Status (Intercept)				
Mean	(--)	.74 (.09)**	(--)	.44 (.07)**
Variance	(--)	.32 (.04)**	(--)	.16 (.02_**
Additive Coefficient (Linear Slope)				
Mean	(--)	.14 (.05)**	(--)	.06 (.04)
Variance	(--)	.02 (.01)**	(--)	.01 (.01)**
Proportional Coefficient				
β	-.01 (.03)	-.16 (.04)**	.01 (.03)	-.22 (.05)**
Coupling Parameters				
γ	(--)	.02 (.01)*	(--)	(--)
Goodness of Fit Indices				
χ^2		51.92		41.81
df		19		20
χ^2/df		2.73		2.09
NFI		.94		.95
CFI		.96		.97
RMSEA		.08		.06
AIC		83.92		71.81

Note, Unstandardized parameter estimates presented with standard error in parentheses.

(--) = parameter not estimated in model;

*
$p < .05$.

**
$p < .01$.

Table 3

Results from Bivariate Latent Difference Score Models of Association between Marital Satisfaction and Depressive Symptoms

	Husbands: Transactional Model		Wives: No Coupling Model	
Parameter Estimates	**Depressive Symptoms**	**Marital Satisfaction**	**Depressive Symptoms**	**Marital Satisfaction**
Initial Status (Intercept)				
Mean	.44 (.07)**	109.48 (3.22)**	.75 (.09)**	109.88 (3.58)**
Variance	.17 (.02)**	398.93 (10.16)**	.32 (.04)**	504.07 (49.26)**
Additive Coefficient (Linear Slope)				
Mean	.26 (.11)*	-1.63 (1.63)	.12 (.05)*	-6.91 (1.69)**
Variance	.01 (.01)**	9.18 (8.22)	.02 (.01)*	42.97 (1.69)**
Proportional Coefficient				
β	-.25 (.05)**	(--)	-.14 (.04)**	(--)
Coupling Parameters				
γ	-.002 (.001)*	-4.05 (1.99)*	(--)	(--)
Goodness of Fit Indices				
χ^2	9.82		20.92	
df	13		15	
χ^2/df	.76		1.39	
NFI	.99		.98	
CFI	1.00		.99	
RMSEA	.00		.04	
AIC	53.82		60.92	

Note. Unstandardized parameter estimates presented with standard error in parentheses.

(--) = parameter not estimated in model

*
$p < .05$.

**
$p < .01$.