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Prospective effects of marital satisfaction on depressive symptoms in established marriages: A dyadic model

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ABSTRACT

Much evidence suggests that marital discord is related to depressive symptoms in married couples. In the present research, potential sex-related differences in the prospective effect of marital discord on depression were explored. Further, extending previous work, cross-spouse effects (i.e., the associations between one spouse's marital discord and his or her partner's later levels of depressive symptoms) were examined. Spouses from randomly sampled married couples ($N = 166$) with adolescent children provided reports of their marital quality and depressive symptoms at baseline and one year later. Structural equation modeling analyses were conducted. Results revealed that Time 1 marital quality was associated with Time 2 depressive symptoms, the magnitude of this effect was similar for both husbands and wives, and spouses' own marital quality at Time 1 predicted their partners' Time 2 depressive symptoms net of other predictors in the model. Implications for practice, policy, and future research are discussed.

KEY WORDS: depression • longitudinal study • marriage

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Marital dissatisfaction has a variety of effects on physical and emotional health. For example, marital discord increases risk for destructive conflict patterns (Gottman, 1998), is associated with physiological reactivity (Levenson, Carstensen, & Gottman, 1994), and leads to suppressed immune system functioning (Kiecolt-Glaser, Malarkey, & Chee, 1993). Another insidious consequence of marital discord is emotional misery. Marital dissatisfaction is linked to sadness, irritability, and diminished interest in sex, as well as other depressive symptoms. Further, marital dissatisfaction may be intertwined with diagnosable episodes of major depression as well as with sub-clinical changes in depressive symptomatology (Beach, 2001). Thus, the psychological toll of marital discord can be quite severe for individuals and their partners.

In a recent quantitative and exhaustive review of the literature on the link between marital quality and depression, Whisman (2001) found that, across 26 cross-sectional studies of community samples, marital quality was negatively associated with depressive symptoms among both women ($r = -.42$) and men ($r = -.37$), and that this sex difference in degree of association was significant. Across 10 studies using clinical populations of patients with diagnoses of depression, Whisman (2001) also found a strong negative association ($r = -.66$) between marital satisfaction and depression across both sexes, but no test of sex differences was performed. Accordingly, it appears that marital discord is related to depressive symptoms, and that the concurrent relationship may be somewhat stronger for wives than for husbands.

Marital dissatisfaction has also been found to predict increases in depressive symptoms over time (Beach & O'Leary, 1993a, 1993b; Fincham, Beach, Harold, & Osborne, 1997), to co-vary with changes in depressive symptoms (Karney, 2001; Kurdek, 1998), and to increase risk for a major depressive episode in the following year (Whisman & Bruce, 1999). Examining the effect of experiencing distressing marital events relative to no such events, Cano and O'Leary (2000) found that marital events resulted in a six-fold increase in the risk of clinical depression; and this increased risk remained after controlling for family and personal history of depression.

These studies suggest that marital discord and severe marital stressors may be sufficiently potent to precipitate a major depressive episode that may not have occurred otherwise, or perhaps, that would not have occurred as soon in the absence of marital discord. Accordingly, marital discord seems to exert a significant psychological toll on many spouses (but see Coyne & Benazon, 2001, for a cautionary note). At the same time, there is much about the prospective effect of marital discord on depression that remains poorly understood. The two broad issues addressed in the present research involve potential sex-related differences in the effects of marital discord on depressive symptoms over time, and the effects of spouses' marital discord on their partners' levels of depression.

The role of sex differences

Many researchers have documented sex differences in rates of depression as well as marital roles and behaviors. Women are about twice as likely as men to experience clinical major depression (e.g., Weissman, 1987). Traditional stereotypes about women and femininity in North America suggest that intimate relationships with others are central to women's personal identities (Culp & Beach, 1998). These stereotypes can be traced back to the Industrial Revolution, when women and men began to separate family and economic responsibilities (Welter, 1978), and women became known as the 'experts' in love and in maintaining relationship harmony (Cancian, 1987).

It is perhaps not surprising that many have assumed that the processes linking marital dissatisfaction to depression may also differ by sex. Specifically, it is commonly suggested that women's greater sensitivity to marital discord may account for some portion of sex differences in rates of depression (e.g., Dehle & Weiss, 1998). Marital discord could be experienced as a significant stressor for those individuals, commonly women, who adopt a marital gatekeeper role. In support of this hypothesis, there is a small but significant sex difference in the magnitude of the concurrent relationship between marital dissatisfaction and depressive symptoms (Whisman, 2001).

However, there are marked inconsistencies in the broader literature regarding sex differences in the relationship between marital discord and depression. For example, Fincham et al. (1997) studied newlywed couples over 18 months and found that earlier marital satisfaction predicted change in depressive symptoms significantly more strongly for wives than for husbands. In contrast, Kurdek (1998) studied newlywed couples in first marriages over three years and found that earlier marital satisfaction predicted later depressive symptoms for husbands, but not for wives; however, no significant sex difference in effect was reported. Subsequently, Kurdek (1999) included newlyweds from first and second marriages in his analysis (including the couples from the 1998 analysis), and examined the effect of marital satisfaction over a one-year period. In this reanalysis, Kurdek (1999) found a significant predictive effect for both husbands and wives, again with no significant sex difference. Finally, Whisman and Bruce (1999) examined a community sample of persons in established marriages and found evidence of an effect of marital distress on incidence of major depression, but no evidence of sex differences in the incidence of major depression as a function of earlier marital distress.

Overall, it seems premature to conclude on the basis of currently available evidence that sex differences in the effect of marital discord on depression are large and consistent across populations. Current evidence suggests that there is a prospective relationship between marital satisfaction and later depressive symptoms. However, evidence for a sex difference in the magnitude of the prospective effect is equivocal among newlyweds, and the available evidence does not support the hypothesis of a sex difference in a prospective effect in established marital relationships.

One reason that partners in established marriages might show little or no

sex difference in the effect of marital discord on depressive symptoms is that sex differences may tend to decrease as marriages develop. For example, owing to sex socialization experiences, many newlywed women could begin the marriage feeling largely responsible for solving marital problems (e.g., Lerner, 1987), or by investing more of themselves in the relationship than their partners. Over time, however, married men may 'catch up' and come to be equally responsible and invested, particularly as the negative consequences of marital discord become more salient or as less invested men exit the pool of married persons through divorce. Another reason that sex differences over time might disappear is that, with age, sex roles of women and men in Western cultures tend to converge; many men become more family-oriented as they mature into middle age and beyond. In other words, women and men in established marriages may have similar levels of investment in and responsibility for their own and their partners' marital happiness.

Supporting this conjecture, studies of sex differences in response to marital disruption and divorce have found little evidence of sex differences in the effects of relationship problems on emotional distress (Kessler & McLeod, 1984) or onset of a depressive episode (Nazroo, Edwards, & Brown, 1997). As such, although the issue of sex differences in the prospective effect of marital discord on depressive symptoms remains unsettled, there may be less reason to expect sex differences in established, stable marriages than in newlywed marriages. In the current investigation, we examined change in depressive symptoms in a community sample of stably married couples. In addition, we examined sex differences in the prospective effect of marital discord on depression while allowing for possible sex differences in the magnitude of the concurrent association and in the stability of depressive symptoms.

How do spouses influence each other?

Finally, there is a critical question of cross-spouse effects. Cross-spouse effects have received little attention in the literature to date. Instead, most attention has focused on the role of one's own marital dissatisfaction in predicting one's own later depressive symptoms. However, in a study of 30 young medical students and their spouses, Katz, Monnier, Beach, Libet, and Shaw (2000) found that female spouses of medical students were more likely to endorse depressive symptoms if their medical student partners concurrently endorsed lower marital quality ($r = .62$). However, male medical students' depressive symptoms were not significantly related to spouses' marital quality ($r = -.22$), suggesting that apparent cross-spouse effects were limited to female spouses only. Accordingly, these data raise the possibility that for partners who see themselves as playing a supportive role to the other, spousal dissatisfaction may have a substantial impact on one's own depressive symptoms.

More compelling cross-spouse effects would be present if, net of one's own level of marital satisfaction, one's partner's marital satisfaction predicted change in one's depressive symptoms over time. In the only

prospective study to directly examine the issue to date, Fincham et al. (1997) found no evidence of one spouse's marital satisfaction predicting the other's later depressive symptoms. However, because this was a newlywed sample, one might anticipate that partners were not yet sufficiently tuned into each other's levels of satisfaction to allow cross-partner effects to emerge. Supporting this conjecture, partner satisfaction did not predict change in depressive symptoms (even without controlling for own level of satisfaction), and was only moderately stable ($r_s = .52$ and $.57$ for husbands and wives, respectively). In an established sample of married couples, however, one might more reasonably expect cross-spouse effects to emerge because satisfaction might be more stable across the time period, less reactive to partner satisfaction, and more clearly communicated to the partner.

Cross-spouse effects should be evident if some aspects of a spouse's distress directly influence the partner's depressive symptoms without influencing the partner's marital satisfaction. One possibility is that a spouse's negative evaluation of a partner might influence the partner's later depressive symptoms but not concurrent satisfaction, a pathway examined by Katz and Beach (1997). These authors studied the effects of perceived evaluations from romantic partners on women's relationship satisfaction and depressive symptoms. Negative evaluations, when consistent with participants' own self-views, were associated with greater depressive symptoms without affecting relationship satisfaction. Thus, own marital dissatisfaction and partner dissatisfaction exerted independent effects on depressive symptoms. This research suggests the possibility that spouses could convey low regard for their partners due to their low marital dissatisfaction and produce an increase in partners' depressive symptoms that would be independent of the effect of the partner's own marital satisfaction. If so, this should be visible in the form of cross-spouse effects: a spouse's marital satisfaction should predict the partner's later depressive symptoms, above and beyond any effect of the partners' own marital satisfaction.

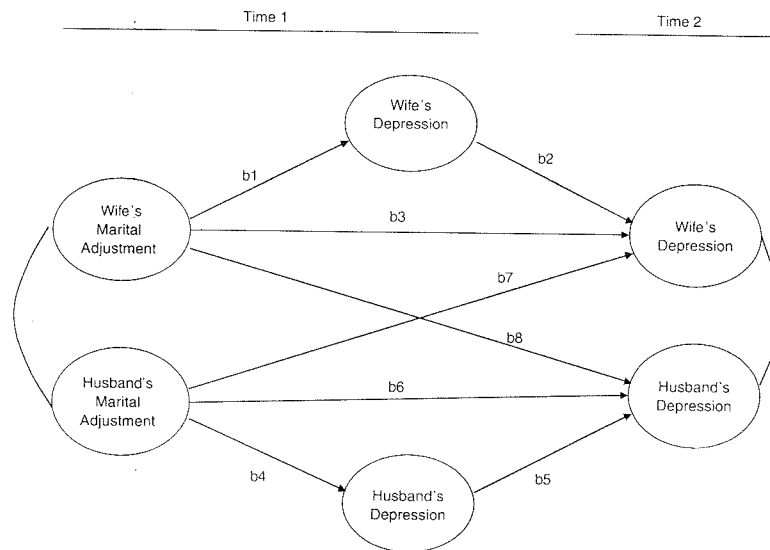
Also of interest is the issue of sex differences in cross-over effects of one spouse's marital satisfaction on the other's level of depressive symptoms. Because previous research has not examined the issue of cross-over effects in a prospective design, it is not possible to form predictions based on prior studies. However, a case can be made for sex differences in cross-over effects. For example, one could argue for a greater effect for husbands' marital satisfaction on wives' later depression because men may be more likely to use active and forceful strategies to control others (Kuebli & Fivush, 1992), or to blame their partners (and not themselves) for marital distress. Support for this hypothesis would be consistent with the cross-sectional results reported by Katz et al. (2000). However, a case could be made for a greater effect of wives' marital dissatisfaction on husbands' later depressive symptoms. That is, because women may be more prone to try and engage partners in marital issues (Christensen & Heavey, 1999) and provide more valid assessments of marital satisfaction (Davey, Fincham, Beach, & Brody, 2001), their self-reported dissatisfaction may prove more

consequential for both their own later depressive symptoms and for their partner's depressive symptoms.

Based on the foregoing review of literature, we formulated a hypothetical model that guided the present study. Figure 1 presents our conceptual model. Specifically, in the present study we examined four central hypotheses in developing a dyadic model of the effects of marital discord on depressive symptoms in established couples.

- 1 We hypothesized that each spouses' own marital satisfaction would be associated with their own current level of depressive symptoms.
- 2 We hypothesized that each spouses' own marital satisfaction would predict their own depressive symptoms one year later, even after controlling for initial depressive symptoms.
- 3 We hypothesized that there would be a significant sex difference in the prospective association between earlier marital satisfaction and later depressive symptoms.
- 4 We hypothesized that there would be significant cross-spouse effects of earlier marital satisfaction on later depressive symptoms, even after accounting for within-spouse effects.

FIGURE 1
Conceptual model.



Note. *b*s presented indicate pathways that were hypothesized and tested in SEM.

Method

Sample

One hundred sixty-six families from northern and middle Georgia participated in the two waves of data collection used for the current project (for more details, see the Adolescent Development Research Program, described in Brody, Flor, Hollett-Wright, & McCoy, 1998). The requirements for participation mandated that couples were in intact first marriages and had an 11- or 12-year-old adolescent in the home. Accordingly, all marriages were well established, and all couples lived with children in the home. A telephone directory-based random sampling strategy aimed at contacting households that included at least one child between 10 and 15 years of age was used for recruitment. Letters were sent to these households to acquaint couples with the purposes of the study and to inform them that they would be contacted by a staff member to determine their eligibility and willingness to participate.

All White and approximately 50% of the African American families in our sample were recruited as described earlier. In addition to the random sampling of African American families, a more purposive sampling strategy was used. During summer 1994, leaders (e.g., ministers, social workers) in rural Georgia communities were solicited to identify families who might be eligible for, and interested in, our study. Also, the African American families who had agreed to participate in our study were asked to provide the names of friends and acquaintances who met the criteria and who could be contacted by one of our staff members to determine their willingness to participate. Thirty of the 54 African American families who participated in Time 1 of the study were contacted in this way.

Participants in the present study were 166 married couples with complete data at Time 1 and Time 2. Time 2 data were collected approximately one year later. Husbands (84% White) had a mean age of 41.1 years. Only 6% had less than a high school education; 51% had completed high school or some college, and 44% had completed college or advanced degrees. Wives (82% White) had a mean age of 38.5 years. Again, only 2% of wives had less than a college education; 62% had graduated high school or had some college, and 36% had completed college or an advanced degree. The median family income was \$47,439. Couples had a mean of 2.5 children.

Sample representativeness. A direct comparison of our sample against existing census figures was not possible to assess representativeness, because characteristics of couples in stable marriages with adolescent children are not presented in census tables. However, by virtue of the fact that they agreed to participate in this longitudinal study, participants were likely to be slightly more advantaged in terms of income and education than the population in general. Looking longitudinally, nonresponse at Time 2 was predicted using logistic regression models using participants' Time 1 characteristics. African Americans were more likely than Whites to drop out of the study by Time 2. No other study variables were associated with nonresponse. As a result, we compared Whites and African Americans on all study variables. No significant differences on any variables were found. Thus, our cross-sectional findings appear to be fairly representative of the population from which they were drawn. Likewise, while nonresponse at Time 2 was systematic in our sample, these processes do not appear to have impaired the external validity of our findings.

Measures

The Marital Adjustment Test. The Marital Adjustment Test (MAT; Locke & Wallace, 1959) is a 15-item scale that includes questions about the extent of spouse agreement across a variety of situations, such as handling money, and social and recreational activities. All ratings are made on a 6-point scale from *always agree* to *always disagree*. Internal consistencies for husbands and wives were .84 and .86, respectively, at Time 1.

Center for Epidemiologic Studies – Depression Scale. The Center for Epidemiologic Studies – Depression Scale (CES-D) is a 20-item measure developed to assess depressive symptoms in a community sample (Radloff, 1977), which was ideal for the current investigation. The CES-D uses items that are rated on a 4-point Likert-type scale indicating how often in the past week the respondent experienced various depressive symptoms (e.g. 'How often did you feel like not eating; had a poor appetite?' 'How often did you feel that everything you did was an effort?'). Responses were summed across items. Internal consistencies for husbands and wives, respectively, were .84 and .89 at Time 1, and .87 and .86 at Time 2.

Procedure

Home visits were made to each family by teams of two research assistants who had received four weeks of training in administering the procedures used in the study. During the first home visit, parents consented to their own and their children's participation in the study, and the children assented to their own participation.

At each home visit, questionnaires were administered to each parent and child privately, with no other family members present. These instruments were presented to each respondent on a laptop computer. Items were presented one at a time on the computer screen, and participants entered their response selections on keypads with large numerals. The research assistant presented the questionnaires orally to those participants who could not read (fewer than 10%). In this case, when responses to a Likert scale were required, the family member was shown a card with a numbered series of dots in graduated sizes corresponding to the magnitude of the responses from which he or she was to choose; the respondent was then asked to enter on the computer the number beside the dot on the card. A cardboard partition prevented the research assistant from seeing the respondent's answers.

Results

Plan of analysis

A series of nested model comparisons were conducted to test the four research hypotheses, such as sex differences and cross-spouse effects. As the first step, we tested a hypothetical model (see Figure 1) in which all structural parameters (e.g., b1 to b8) were freely estimated without any equality constraints across sex or for cross-spouse effects. This fully unconstrained model was used as the baseline model for comparison with nested models in which we hypothesized the structural relationships between own marital satisfaction and own depression to be the same across sex or the structural relationships between

own marital satisfaction and partner depression to be the same across spouse. As criteria for model comparisons, we examined deterioration of overall model-data fit in terms of chi-square statistics (i.e., change in χ^2 ; $\Delta\chi^2$) as recommended by Bollen (1989), along with model fit indices. If equality constraints imposed on paths yielded a statistically significant, or marginally significant ($p < .10$), deterioration in overall model fit, these constraints were released to detect either sex differences or cross-spouse effects.

It was important to model husband and wife data as part of a single system. By doing so, sex differences could be examined while allowing the potential inter-relatedness of the various estimates to be considered (Kenny, 1996). In the current set of analyses, we allowed Time 1 marital satisfaction and Time 2 depressive symptoms to correlate across spouses in all models.

In this application, data were analyzed via structural equation modeling (SEM). The hypothetical models were tested using maximum likelihood estimation procedures in LISREL 8 (Jöreskog & Sörbom, 1996). Regarding model specification, one manifest indicator, the summed scale score, represented each construct in all models. Thus, residuals for each construct were pre-specified using the scales' internal consistency coefficients instead of assuming perfect representation for the latent variables. Table 1 presents the correlation matrix, means, standard deviations, and internal consistency coefficients for the study variables.

Development of the final model

Table 2 presents overall model fit indices for the hypothesized models in this study. Nested model comparisons based on chi-square difference tests are presented in Table 3. In each comparison, the fit of the constrained models was compared to the fit of the baseline model. In addition, structural path coefficients labeled as bs in Figure 1 represent the tests of our hypotheses about the relations among the theoretical constructs. These paths are referred to below when various nested models were tested for fit to the data.

TABLE 1
Intercorrelations, means, standard deviations, and alpha coefficients for all study variables

Study variables	1	2	3	4	5	6
1. Wife's marital satisfaction: T1	1.00					
2. Wife's depression: T1	-.44	1.00				
3. Wife's depression: T2	-.41	.46	1.00			
4. Husband's marital satisfaction: T1	.49	-.11	-.24	1.00		
5. Husband's depression: T1	-.26	.11	.19	-.29	1.00	
6. Husband's depression: T2	-.36	.15	.34	-.35	.60	1.00
<i>M</i>	117.33	10.05	9.44	119.38	7.51	9.05
<i>SD</i>	24.91	9.76	9.16	23.68	7.35	9.08
α	.86	.89	.86	.84	.84	.87

Note. $r > .16$, $p < .05$; $r > .20$, $p < .01$; $N = 166$. T1 = Time 1; T2 = Time 2.

TABLE 2
Overall model fit indices examining cross-lagged effect of marital satisfaction on depression

Models/Indices	χ^2	df	GFI	RMSEA	NFI	CFI
Unconstrained by gender (M6)	8.19	5	.98	.06	.97	.99
Cross-sectional relationship constrained (M5: b1 = b4)	11.90	6	.98	.08	.95	.98
Stability of depression constrained (M4: b2 = b5)	16.50	6	.97	.10	.94	.96
Lagged relationship constrained (M3: b3 = b6)	8.71	6	.98	.05	.97	.99
Cross-spouse lagged relationship constrained (M2: b7 = b8)	8.46	6	.98	.05	.97	.99
Cross-spouse and lagged relationship constrained (M1: b3 = b6; b7 = b8)	8.71	7	.98	.04	.97	.99

Note. GFI = Goodness of Fit Index. RMSEA = Root Mean Square Error of Approximation. NFI = Normed Fit Index. CFI = Comparative Fit Index.

TABLE 3
Chi-square differences for nested models with equality constraints for husbands and wives

Model comparisons	$\Delta\chi^2$	Δdf	<i>p</i>
M6 (unconstrained) versus M5 (b1 = b4)	3.71	1	.054
M6 versus M4 (b2 = b5)	8.31	1	.004
M6 versus M3 (b3 = b6)	.51	1	.473
M6 versus M2 (b7 = b8)	.27	1	.607
M6 versus M1 (b3 = b6; b7 = b8)	.51	2	.773

Note. $\Delta\chi^2$ = Change in chi-square statistics between the two models. Δdf = Change in degrees of freedom between the two models.

Baseline model. The unconstrained model, in which Time 1 marital satisfaction is allowed to predict own Time 1 depressive symptoms, and both partners' Time 2 depressive symptoms, was simultaneously fit for husbands' and wives' data. This fully unconstrained model (model 6 hereafter) provided an excellent model fit to the data, $\chi^2(5, N = 166) = 8.19, ns$, Normed Fit Index (NFI) = .97, Comparative Fit Index (CFI) = .99, Root Mean Square Error of Approximation (RMSEA) = .06 (90% Confidence Interval [CI]: .00-.14).

Model 5: b1 = b4. In model 5, we imposed the constraint that the within-spouse, cross-sectional pathway between Time 1 marital satisfaction and Time 1 depressive symptoms to be equal for husbands (b4) and wives (b1). This model also yielded an acceptable overall model fit, $\chi^2(6, N = 166) = 11.90, ns$, NFI =

.95, CFI = .98, RMSEA = .08 (90% CI: .00-.14). Compared with the baseline model, however, adding this constraint yielded a marginally significant deterioration in overall model fit, $\Delta\chi^2(1, N = 166) = 3.71, p = .054$. Accordingly, we rejected the assumption of an equal cross-sectional relationship for husbands and wives; thus, we did not constrain these paths to be equal in subsequent models.

Model 4: b2 = b5. When we imposed the equality constraint on the within-spouse stability of depression over time for husbands (b5) and wives (b2), the resulting model yielded acceptable fit for practical purposes (NFI = .94, CFI = .96), but not for statistical purposes ($\chi^2(6, N = 166) = 16.50, p < .05$, RMSEA = .10 [90% CI: .04-.16]). Furthermore, compared to the baseline model, this model represents a significant deterioration in model fit, $\Delta\chi^2(1, N = 166) = 8.31, p < .01$. Accordingly, we rejected the assumption of equal stability in depressive symptoms for husbands and wives (b2 = b5), and, therefore, did not constrain these paths to be equal in subsequent models.

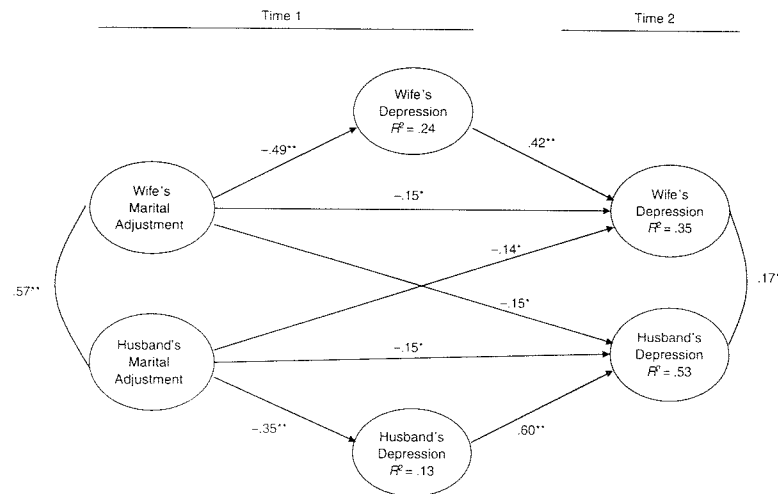
Model 3: b3 = b6. In model 3, we tested the equality of the within-spouse, lagged relationship between marital satisfaction and depressive symptoms by constraining this lagged effect to be equal for husbands (b6) and wives (b3). This model yielded an excellent model fit, $\chi^2(6, N = 166) = 8.71, ns$, NFI = .97, CFI = .99, RMSEA = .05 (90% CI: .00-.12), and represented no significant deterioration in model fit, $\Delta\chi^2(1, N = 166) = .51, ns$. Accordingly, we did not reject the assumption of equal within-spouse, cross-lagged effects (b3 = b6), and these paths were constrained to be equal in the final model (model 1).

Model 2: b7 = b8. We imposed the equality constraint on the cross-spouse, lagged relationship between marital satisfaction and depressive symptoms for husbands (b7) and wives (b8). This model also yielded an excellent model fit, $\chi^2(6, N = 166) = 8.46, ns$, NFI = .97, CFI = .99, RMSEA = .05 (90% CI: .00-.12), and once again represented no significant deterioration in model fit, $\Delta\chi^2(1, N = 166) = .27, ns$. As such, we did not reject the assumption of equal cross-spouse, cross-lagged effects (b7 = b8). These paths were, therefore, constrained to be equal in the final model.

Model 1 (b3 = b6; b7 = b8). Based on a series of model comparisons conducted earlier, we constrained only the two sets of paths for which the assumption of equal structural relationships was not rejected in our final model (model 1, see Figure 2). The final model provided an excellent fit to the data, $\chi^2(7, N = 166) = 8.71, ns$, NFI = .97, CFI = .99, RMSEA = .04 (90% CI: .00-.11), and did not represent a deterioration in fit relative to the fully unconstrained model (model 6), $\Delta\chi^2(2, N = 166) = .51, ns$. All the structural coefficients (standardized β s) were significant at $p < .05$ as can be seen in Figure 2. Coefficients constrained to be equal are slightly different in some cases. This results from the fact that the model is estimated to constrain the unstandardized coefficients, whereas for ease of comparison across coefficients in the model we report the fully standardized coefficients.

More specifically, the final model indicated that wives' Time 1 depressive symptoms were more strongly negatively related to Time 1 marital satisfaction (b1 = -.49, $p < .01$) than were husbands' (b4 = -.35, $p < .01$), and that depressive symptoms were significantly more stable for husbands (b5 = .60, $p < .01$)

FIGURE 2
Structural model of pathways from marital satisfaction to depressive symptoms in established marriage.



Note. The values presented are standardized parameter estimates. All estimated structural parameters were statistically significant. * $p < .05$, ** $p < .01$.

than for wives ($b2 = .42, p < .01$), although once again, the structural relations were significant for both. The sets of lagged relationships for both the within-spouse effect of Time 1 satisfaction on later depressive symptoms and the cross-spouse effects of Time 1 satisfaction on later partner depressive symptoms were also significant, $p < .05$.

To test whether the within-spouse lagged effects of Time 1 marital satisfaction on later depressive symptoms was superfluous, we fixed the paths to be zero for husbands and wives and tested the resulting change in model fit relative to model 1. This model yielded an acceptable overall model fit ($\chi^2(8, N = 166) = 13.25, p = .1$); however, the chi-square difference test indicated a significant deterioration in model fit relative to model 1 ($\Delta\chi^2(1, N = 166) = 4.55, p < .05$). Similarly, when constraining the cross-spouse, direct path from Time 1 marital satisfaction to the partner's later depressive symptoms to be zero, the model again yielded an adequate model fit ($\chi^2(8, N = 166) = 14.08, p = .08$). Once again, however, this constraint yielded a significant deterioration in model fit relative to final model 1 ($\Delta\chi^2(1, N = 166) = 5.37, p < .05$).

Accordingly, it is possible to reject the null hypotheses of no lagged effects from marital satisfaction to later depressive symptoms both within and between spouses. Disattenuated for measurement error, the final model 1 accounted for

53% and 35% of the reliable variance in husbands' and wives' Time 2 depression scores, respectively.

Discussion

The current study provides a methodologically sophisticated test of the marital discord model of depression (Beach, Sandeen, & O'Leary, 1990) in a community sample of persons in established, committed marriages. By using a series of nested models within a LISREL causal modeling framework, we conducted a sensitive test of both key elements of the marital discord model and addressed possible sex differences in the connection between marital distress and depression. In addition, we were able to extend the marital discord model by addressing the issue of cross-spouse effects – an issue of considerable importance for marital therapy or marital enhancement aimed at preventing future depressive symptoms.

Strengths of the present research should be highlighted. The current study represents an advance over the Fincham et al. (1997) study in that we used a single model to estimate effects for husbands and wives simultaneously. In the current study, we allowed marital distress and Time 2 depression scores to correlate across spouses, and so we were able to test for sex differences in theoretically important pathways, while allowing for the interrelatedness of the data from spouses. However, it should be noted that, when the Fincham et al. data were reanalyzed to estimate effects with both spouses in a single model, there was no change in the pattern of results (Beach, Davey, & Fincham, 1999), suggesting that this methodological advance may not change parameter estimates dramatically. The current study also represents an advance over the Kurdek (1998, 1999) study in that we estimated cross-spouse, lagged effects, which were not included in the Kurdek models. Unlike either the Fincham et al. or Kurdek studies, the current investigation focused attention on established marriages in the general community – a sample in which sex similarities rather than sex differences were most likely.

In this randomly drawn sample of established marriages, level of marital satisfaction predicted change in self-reported symptoms of depression one year later. This is a key prediction of the marital discord model of depression (Beach et al., 1990) and suggests that marital satisfaction is a potential point of intervention for the prevention of depressive symptoms for both husbands and wives. In the current investigation, earlier satisfaction predicted later depressive symptoms for both husbands and wives and did so equally well. This supports the hypothesis that greater marital satisfaction may be useful for both husbands and wives in decreasing risk for subsequent symptoms of depression.

Because the issue of sex differences has been quite prominent in the study of the connection between marital discord and depression, we examined possible sex differences for each of the causal pathways specified

in the model. Consistent with Whisman (2001), we found a marginally significant sex difference in the magnitude of the concurrent association between marital distress and depressive symptoms. The connection was significant for both husbands and wives, but was marginally stronger for wives. Replicating Fincham et al. (1997), we found significantly greater stability of depressive symptoms for husbands than for wives. Accordingly, in examining the longitudinal effects in the model, we did not force these relationships to be identical across sex. However, in testing the longitudinal relationships, we found no evidence of sex differences in the magnitude of the within-spouse effects or in the cross-spouse effects of earlier marital satisfaction on later depressive symptoms.

We also examined cross-spouse effects. Husbands' earlier marital satisfaction predicted wives' later depressive symptoms; likewise, wives' earlier marital satisfaction predicted husbands' later depressive symptoms. Of note, these cross-spouse effects were net of the predictive effect of one's own initial marital satisfaction. These effects, therefore, represent an additional influence of the marital system on depressive symptoms, suggesting the potential importance of systemic influences that do not operate through one's own marital satisfaction. In the current model, husband effects on later wife depressive symptoms and wife effects on later husband depressive symptoms were of equal magnitudes. Further, these cross-spouse effects were of similar magnitude to the within-spouse effects. At a practical level, cross-spouse effects underscore the potential utility of a couples format in prevention work aimed at depressive symptoms. At a theoretical level, these results suggest the need for continuing investigation of partner-driven effects, such as negative self-verification, that are known to influence depressive symptoms and that are not mediated through one's own level of satisfaction with the relationship (Katz & Beach, 1997).

The current study is the first to directly examine cross-spouse, prospective effects in a time-lagged design. Accordingly, it will be important to see these results replicated in other samples. Replicable cross-spouse effects are particularly exciting because they suggest that understanding the influences of marital processes on depressive symptomatology will require a truly dyadic perspective.

The final model, model 1, showed an excellent fit to the data. This model suggests that, for intact long-term marital relationships, there is a significant relationship between marital processes and depression. This is manifested in both a significant concurrent relationship between marital satisfaction and depressive symptoms for men and women, and a continuing influence of satisfaction on later depressive symptoms. For women and men, own satisfaction predicted shifts in depression beyond the effect of own prior depressive symptoms. Contrary to concerns that such effects might be discernable only in the early parts of marriage (Beach & O'Leary, 1993b), the effects were significant for both women and men who had been married for many years.

Caveat

When interpreting the current results, it is important to remember that the appropriate time frame within which to observe causal effects between marital satisfaction and depression is not known. This creates some difficulty in estimating the magnitude of any hypothesized causal relationship between marital discord and depression. Because use of the correct lag should result in the largest estimate of causal effect, the causal relationship of the two variables may be seriously underestimated if our estimate of causal effect consists of only the cross-lagged relationship between the variables measured across an arbitrary time interval. As suggested by Fincham et al. (1997), the optimal lag time for observing the effect of marital distress on depression may be considerably shorter than one year. Accordingly, the current estimates of the effect of marital distress on later depressive symptoms may substantially underestimate the true magnitude of the effect.

At the same time, because the focus of the current investigation was on the prospective effect of marital satisfaction, we did not include Time 2 satisfaction scores in our models. As has been shown by Karney (2001) and Kurdek (1998, 1999), inclusion of concurrent satisfaction scores suggests that the effects linking satisfaction and depression are 'doubly developmental' (Kurdek, 1998) in the sense that satisfaction and depression scores tend to change together. Accordingly, the current results should not be taken as contradictory to these previous findings. Likewise, we did not examine the effect of Time 1 depression on later satisfaction. As previous research has suggested (e.g. Davila, Bradbury, Cohan, & Tochluk, 1997), because of the reciprocal effects between depression and satisfaction, there is likely to be an effect in this direction as well. Accordingly, the results should not be taken as indicating a unidirectional, or even a greater relative flow of causality from marital satisfaction to depression than vice versa.

We maintained a focus on the prospective effect of marital adjustment, as this most directly informs discussions of the potential for utilizing marital satisfaction as a point of intervention for the prevention of later depressive symptoms. Inclusion of Time 2 satisfaction is of interest to address questions of relative causal effects and the time frame of effects, but does not advance the discussion of satisfaction as a potential point of preventative intervention.

The current data help advance the marital discord model of depression by indicating important cross-spouse effects between marital satisfaction and depression, by resolving questions about the applicability of the marital discord model to established marriages, and by examining questions related to sex differences in the connection between marital distress and depression. The data are supportive of the marital discord model of depression; however, the current study suggests the need to refine and extend the model to better account for cross-spouse effects and to develop dyadic accounts of marital processes that influence mental health.

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