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Dyadic Processes in Early Marriage: Attributions, Behavior, and Marital Quality

Marital processes in early marriage are important for understanding couples' future marital quality. Spouses' attributions about a partner's behavior have been linked to marital quality, yet the mechanisms underlying this association remain largely unknown. When we used couple data from the Family Transitions Project (N = 280 couples) across the first 4 years of marriage, results from actor-partner interdependence modeling demonstrated that early marriage responsibility attributions were associated with marital quality 4 years later after controlling for initial marital quality. Further, couples' warm and hostile behavior 2 years into the marriage mediated the attribution-marital quality association. The results suggest that interventions designed to facilitate change

in romantic relationships may benefit from addressing attributions for the partner's behavior, in addition to changing behaviors, as part of a dyadic process unfolding across time.

Although marital researchers have long been interested in the association between attributions and marital quality (Bradbury & Fincham, 1990), much remains unknown about the mechanisms linking the two constructs (McNulty & Karney, 2001). Research has typically focused on correlates of attributions and overlooked processes through which attributions might operate. The primary goal of this study was to identify and test possible intra- and interspousal processes that might advance understanding of attributions in marriage and facilitate interventions with couples. This goal was addressed by conducting a prospective, longitudinal study that examined spouses' attributions, behavior, and marital quality using multiple informants at three assessment points across the first 4 years of marriage.

ATTRIBUTIONS AND MARITAL QUALITY

The attributions or explanations that spouses offer for a partner's behavior have been consistently linked to their marital quality (Bradbury & Fincham, 1990; Thompson & Snyder, 1986) making the attribution-relationship quality association arguably the most robust phenomenon

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in the close-relationship literature (Fincham, 2001). Attributions can be about who or what caused an event (causal attributions) and those that deal with accountability or answerability for the event (responsibility attributions). Specifically, attributions that accentuate the impact of negative relationship events and minimize the impact of positive relationship events are associated with lower relationship quality. Thus, for example, attributing responsibility for a negative partner behavior (e.g., coming home late) so that it is seen as intentional, blameworthy, and reflecting selfish motivation (e.g., spouse is self-centered) is more likely to promote conflict and has been shown to occur more frequently among distressed partners than among their nondistressed counterparts. Because responsibility attributions tend to be more salient to marital functioning, especially in clinical contexts, and are more proximal to behavior (Davey, Fincham, Beach, & Brody, 2001), we examine them in this study.

Numerous plausible alternative hypotheses for the association between attributions and marital quality have been ruled out. Thus, the attribution-marital quality association is not culture specific (e.g., Sabourin, Lussier, & Wright, 1991), an artifact of the manner in which attributions are assessed (e.g., Fincham & Beach, 1988), or resulting from depression (e.g., Fincham, Beach, & Bradbury, 1989), negative affectivity (e.g., Karney, Bradbury, Fincham, & Sullivan, 1994), relationship violence (e.g., Fincham, Bradbury, Arias, Byrne, & Karney, 1997), or anger (e.g., Senchak & Leonard, 1993). Importantly, longitudinal studies provide data that are consistent with the view that attributions may initiate or maintain marital distress (e.g., Fincham, Harold, & Gano-Phillips, 2000; Karney & Bradbury, 2000). Thus, it is important to study the attributions couples make in the early stages of their relationship that may relate to marital processes.

IN SEARCH OF A MECHANISM

A considerable body of literature has emerged on attributions in marriage, and one might therefore expect that the mechanism linking attributions to relationship quality is well understood. McNulty and Karney (2001) note, however, that, “given the breadth of this research, it is perhaps surprising that the mechanisms through which associations between attributions and relationship

satisfaction come about have yet to be explored directly” (p. 944). We propose that a possible mechanism is that attributions influence spousal behavior, which, in turn, influences marital quality. There is strong support for the link between attributions and spouses’ subsequent behavior toward their partners. Specifically, several studies using observational data have found a relationship between attributions and subsequent positive and negative behaviors. For example, Bradbury and Fincham (1992) found with two different samples that spouses’ conflict promoting attributions were related to less effective problem solving behaviors—especially for wives (Study 1)—higher rates of negative behavior, and, for wives, an increased likelihood of reciprocating negative partner behavior (Study 2). A similar study found that as wives held more conflict-promoting attributions, they were less skilled in problem solving with their spouse (Miller & Bradbury, 1995). Each of these studies, however, had relatively small samples, ranging from 40 to 60 couples, assessed their samples at a single time point, and did not examine interspousal or dyadic effects. The present study builds on this earlier work by using a much larger sample at three differing time points across 4 years and testing both interspousal and intraspousal effects.

The association between warm and hostile behavior and marital quality is also strongly supported by prior studies. This association was the focus of initial research on marriage by psychologists, and a large literature documents a robust association between spousal behavior and marital quality (see reviews by Karney & Bradbury, 1995; Eldridge & Christensen, 2002). We investigated warm and hostile behaviors not only because of their hypothesized relationship to both attributions and marital quality, but also because these behaviors are known to be conflict promoting and relationship enhancing, respectively (Fincham, 2001). In addition to its replication across numerous laboratories, there is evidence to suggest that this association between warm and hostile behavior and marital quality exists cross-culturally (Rehman & Holtzworth-Monroe, 2007).

GENDER DIFFERENCES

Recent research suggests that attributions influence marital quality differentially for husbands and wives (Sanford, 2005). A consistent finding

is that correlations between attributions and behavior tend to be stronger for wives than for husbands (Bradbury, Beach, Fincham, & Nelson, 1996; Bradbury & Fincham, 1992; Miller & Bradbury, 1995). These differences may result from wives being more responsive to the immediate context than are husbands (Carels & Baucom, 1999) and to the fact that wives tend to be more attentive to the subtle details of interpersonal interaction whereas husbands are often less sensitive and respond more on the basis of their overall sentiment (Acitelli, 1992). Thus, the link between attributions and marital quality may be stronger for wives than for husbands and should be assessed independently for husbands and wives simultaneously in the same model.

DYADIC NATURE OF THE ASSOCIATION BETWEEN ATTRIBUTIONS AND MARITAL QUALITY

Attempts to evaluate attributions, behavior, and marital quality simultaneously and the mediating mechanisms among them are rare. The need to do so in a dyadic context is also apparent. It has been commonplace in marital attribution research to focus on what happens within the individual and, by implication, to relegate interspouse effects to a secondary conceptual status. As a result, attributional research has not yet realized its potential to contribute to an understanding of the interdependence that exists between partners (see Kelley et al., 1983). It is logical that a spouse's attributions are manifested through his or her behavior that is consequently perceived by the partner, which then affects the partner's behavior toward the spouse. This process will impact dyadic functioning. Examination of both intra-(actor) and interspouse (partner) effects in marital attribution research is therefore long overdue. The dyadic nature of attributions has been rarely examined (for notable exceptions, see Davey et al., 2001; Karney & Bradbury, 2000; Karney et al., 1994) and seldom examined with attributions, behavior, and marital quality in the same model (see Fletcher & Thomas, 2000).

To examine husbands' and wives' attribution, behavior, and marital quality simultaneously, we followed Kenny, Kashy, and Cook's (2006) recommendations for testing dyadic models. Although husbands and wives are often assumed to be different, whether they are statistically distinguishable for the variables being tested is an empirical question. Therefore, prior

to conducting dyadic analyses, the omnibus test of distinguishability (I-SAT) was used to test for empirical distinguishability (Olsen & Kenny, 2006).

Two kinds of dyadic models are used in the present study to test the hypothesized relationships: the Actor-Partner Interdependence Model (APIM) and the mutual influence model. Both models evaluate dyadic data simultaneously. The APIM examines actor and partner effects from one variable to another (e.g., husband's behavior on wife's marital quality). The mutual influence model examines couples' influence on one another on a single variable (i.e., bidirectional prediction; e.g., husband's behavior to wife's behavior; see Kenny et al., 2006).

THE PRESENT STUDY

Although progress has been made toward understanding spouses' attributions, fundamental questions still remain. Recent studies have examined the relationships among attributions, behavior, and marital quality over relatively brief durations during couple interactions (Sanford, 2006; Waldinger & Schulz, 2006), but longer term influences have not been thoroughly explored. Moreover, a primary reason for studying attributions in marriage—to determine *how* attributions influence marital quality—has received only scant attention.

The purpose of the present research, therefore, is to determine whether spouses' attributions are related to their later marital quality and to determine whether such an association is mediated by behavior between spouses. We hypothesize that both spouses' attributions will be associated with their own marital quality. In addition, marital behavior will mediate the association between attribution and marital quality. On the basis of the dyadic nature of marriage, we expect that husband and wife will influence each other's behavior (mutual influence) and that their behavior will not only influence their own marital quality but also their spouse's marital quality (actor and partner effects). We used both observational and self-report data from both husbands and wives to test the hypothesis that observed and self-reported warmth and hostility 2 years into marriage would mediate the relation between newlyweds' responsibility attributions and their marital quality 4 years into marriage. Initial marital quality was included as a control variable.

METHOD

Samples and Procedures

Participants were 280 married couples who were young adults from the Family Transitions Project (FTP), an ongoing prospective, longitudinal study. The FTP originated from two earlier projects: the Iowa Youth and Families Project (IYFP) and the Iowa Single Parent Project (ISPP). These earlier projects studied target adolescents and their families in north central Iowa beginning in 1989. All participants were of European descent. Detailed information about the FTP can be found in Conger and Conger (2002) and Conger and Elder (1994).

Starting in 1995, as the target youth became adults, their eventual spouses were also recruited into the FTP, providing data from both spouses' perspectives. In 2005, the target youths' average age was 29.07. During this 10-year period, 355 of the targets experienced their first marriage. Full in-home assessments were conducted in odd years and telephone interviews were conducted in even years. As a result, observed and self-report data were available in 1995 (first year after graduation from high school), 1997, 1999, 2001, 2003, and 2005. During the in-home visit (i.e., interviewers visited target adult children at their place of residence), target adults and their romantic partners completed a set of questionnaires focusing on individual characteristics and relationships. In addition, couples also participated in videotaped behavioral interactions discussing their time spent together, conflict and disagreement, future plans, and so forth. The videotapes from this 25-minute discussion task were rated by trained observers using the Iowa Family Interaction Rating Scales (Melby et al., 1998; Melby & Conger, 2001), a global rating system assessing behavioral exchanges (Melby & Conger, 2001). Observers received 200 hours of training and had to pass extensive written and viewing tests. A separate, independent coder was used to provide reliability information for approximately 20% of the observed tasks across all waves of data. Earlier research has been done on couples within this sample (e.g., Conger, Cui, Bryant, & Elder, 2000; Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2008; Donnellan, Larsen-Rife, & Conger, 2005). These earlier studies, however, were primarily concerned with how the family of origin affects early adult romantic relationships, whereas the present paper extends this work by focusing on

the early marriages and dyadic processes within these relationships.

Because different target participants were married at different points in time and played different roles in relationships, the data had to be modified to accommodate these variations. First the data were restructured such that target participants and their partners were all recoded (by gender) as "husbands" and "wives" (rather than as "targets" and "partners"). Second, the marriage year for each spouse was identified, and variables used in the present study were restructured so that Time 1 was the first year of data collection after the couple married, Time 2 was 2 years after Time 1, and Time 3 was 4 years after Time 1. As the purpose of this study was to examine dyadic processes of married couples over time, only those couples who were married with the same spouse for the first 4 years of their marriage (all three time points) were used. This exclusion resulted in 280 married couples with data on three time points in the early stages of their marriage.

The overall retention rate in the FTP from 1995 to 2005 was over 90%. Missing values were largely because of unavailability of data for a specific wave of data collection and not because of selective attrition. As a result, rather than deleting cases with missing data, the present analyses used full-information maximum likelihood (FIML) to test predicted relationships among theoretical constructs. Parameter estimates from FIML provide less biased information than ad hoc procedures such as listwise deletion, pairwise deletion, or imputation of means (Acock, 2005). Because both targets and their spouses completed the questionnaires and participated in the videotaped interactions, observed and self-reported data from both spouses were used, thus allowing us to examine attributions, behavior, and marital quality within and between spouses.

Measures

Research has shown that when a single informant is used to report on all measures in a study, the association among study constructs could partially result from the reporter's dispositional characteristics (Bank, Dishion, Skinner, & Patterson, 1990; Brewin, Firth-Cozens, Furnham, & McManus, 1992; Lorenz, Conger, Simons, Whitbeck, & Elder, 1991). To address this issue, reports from multiple informants (i.e.,

wives, husbands, and observers) at differing time points were used to assess different constructs, therefore reducing shared method variance (Cui, Lorenz, Conger, Melby, & Bryant, 2005). Specifically, attribution was assessed by husbands' and wives' self-reports, behavior was reported by trained observers' reports as well as both husbands' and wives' self-reports, and marital quality was assessed by both husbands' and wives' self-reports. Each of the measures used in this study has been demonstrated to be both a valid and a reliable measurement instrument for responsibility attribution (Fincham & Bradbury,

1992), warm and hostile behavior (Melby & Conger, 2001), and marital quality (Norton, 1983). The variables analyzed in this study were latent variables with multiple indicators for both husbands and wives as described below. Table 1 provides the means, standard deviations, ranges, and alphas for each study variable.

Responsibility attributions. At Time 1, attributions were measured for husbands and wives using the three responsibility attributions from the Relationship Attribution Measure (RAM; Fincham & Bradbury, 1992) as

Table 1. Means, Standard Deviations, Ranges, and Alpha Coefficients for Study Measures

Measure	Mean	SD	Min.	Max.	α (# of items)
Attributions (Time 1)					
Wives attributions					
Intent	9.79	3.97	4	24	0.83 (4)
Selfishness	10.64	4.24	4	24	0.88 (4)
Blameworthy	11.03	4.14	4	24	0.86 (4)
Husbands' attributions					
Intent	10.65	3.95	4	20	0.81 (4)
Selfishness	10.43	3.76	4	20	0.84 (4)
Blameworthy	10.26	3.79	4	20	0.86 (4)
Behavior (Time 2)					
Wives' behavior					
Observed hostility	34.76	7.74	5	45	0.90 (5)
Observed warmth	28.44	6.62	5	45	0.89 (5)
Self-reported hostility	29.35	3.90	5	35	0.83 (5)
Self-reported warmth	24.52	3.35	4	28	0.88 (4)
Husbands' behavior					
Observed hostility	36.88	6.35	5	45	0.86 (5)
Observed warmth	27.61	7.10	5	45	0.91 (5)
Self-reported hostility	28.84	4.04	5	35	0.84 (5)
Self-reported warmth	23.25	3.64	4	28	0.88 (4)
Marital quality (Time 3)					
Wives' marital quality					
We have a good relationship	4.42	0.76	1	5	(1)
Relationship is stable	4.41	0.78	1	5	(1)
Relationship is strong	4.41	0.78	1	5	(1)
Relationship makes me happy	4.46	0.72	1	5	(1)
Part of a team with partner	4.41	0.80	1	5	(1)
Husbands' marital quality					
We have a good relationship	4.42	0.60	2	5	(1)
Relationship is stable	4.33	0.69	2	5	(1)
Relationship is strong	4.33	0.72	2	5	(1)
Relationship makes me happy	4.40	0.67	2	5	(1)
Part of a team with partner	4.31	0.75	2	5	(1)
Marital quality (Time 1)					
Wives' marital quality	4.21	0.95	1	5	(1)
Husbands' marital quality	4.06	1.07	1	5	(1)

indicators of this latent variable. This measure presented both spouses with four negative stimulus events that are likely to occur in all marriages (e.g., "Your spouse criticizes something you say."). For each hypothetical event, spouses were asked to rate their agreement on a scale (1 = *disagree strongly*; 6 = *agree strongly*) with three statements that reflect the three responsibility attribution dimensions: intent, selfishness, and blame. Sample items included "My partner criticized me on purpose rather than unintentionally," "My partner's behavior was motivated by selfish rather than unselfish concerns," and "My partner deserves to be blamed for criticizing me." This scale was used in an effort to capture a more global type of response from each spouse as to how he or she makes attributions in general in the beginning of the marriage and not for a given situation or from a single interaction. Items were coded so that higher scores represent higher degree of distress maintaining attributions.

Warm and hostile behavior. At Time 2, behavior was measured as a latent variable for husbands and wives separately with four indicators: *observed hostility*, *observed warmth*, *self-reported hostility*, and *self-reported warmth*. Observed hostility and observed warmth were reported by trained observers evaluating couples' interactions during the discussion task described earlier. Observed hostility included five items: hostility, antisocial, angry-coercive, verbal attack, and escalate hostility (for definitions of these items, see Melby & Conger, 2001). Each of these five behaviors was rated on a 9-point scale ranging from 1 (*showing none of the behavior*) to 9 (*showing the behavior with high frequency and intensity*). Intraclass correlations between trained observers on these five rating scales ranged from .62 to .81. These five observed scores were summed to obtain a total observed hostility score for husband and for wife and reverse coded such that a higher score represented a lower level of observed hostility (α s for observed hostility were .86 for husbands and .90 for wives at Time 2).

Similarly, the measure of observed warmth was created by summing five observer rating scales from the same discussion task: prosocial, warmth and supportiveness, listener responsiveness, communication, and assertiveness (see Melby & Conger, 2001). Intraclass correlations between trained observers on these five observed

warmth variables ranged from .57 to .76. For each spouse, the prosocial, warmth and supportive, listener responsiveness, communication, and assertiveness scales were summed to create the scale of observed warmth for each spouse. A higher score represented a higher level of observed warmth (α s for observed warmth were .91 for husbands and .89 for wives at Time 2).

In addition to the observed warmth and hostility behaviors, self-reported warmth and self-reported hostility from self to the spouse were also used to increase measurement precision. The hostility scale contained five items asking the respondents about hostile behavior toward their partner (e.g., "During the past month when you and your partner have spent time talking or doing things together, how often did you get angry at your partner?" from 1 = *always* to 7 = *never*). A higher score indicated a lower level of hostility. The five items were then summed together to create a composite score for each spouse (α s for self-reported hostility were .84 for husbands and .83 for wives at Time 2).

The warmth scale contained four items asking about the respondents' warm and supportive behavior toward their partner (e.g., "During the past month when you and your partner have spent time talking or doing things together, how often did you let your partner know you really care about him/her?" from 1 = *always* to 7 = *never*). These warmth items were reverse coded so that a higher score indicated a higher level of warmth. The four items were then summed together to create a composite score for each spouse (α s for self-reported warmth were .88 for both husbands and wives at Time 2).

Marital quality. At Time 3, marital quality was measured as a latent variable for husbands and wives using five items from the Quality of Marriage Index (QMI; Norton, 1983) as indicators of this latent variable. This index of marital quality measures overall evaluations of the relationship and is consistent with recommendations by Fincham and Bradbury (1987) to assess global or summary evaluations of the relationship. Wives and husbands reported how much they agreed with five statements about their relationship using a 5-point scale (1 = *strongly agree*, 5 = *strongly disagree*). Sample items included, "My relationship with my partner makes me happy," and "My relationship with my partner is stable." Items were coded so that higher scores

represented a more positive global perception of the relationship.

In addition, marital quality was also measured at Time 1 with the question, “How happy are you, all things considered, with your relationship?” using a 5-point scale, from *extremely unhappy* to *extremely happy*. This item was used because the QMI was not available at the earlier waves in the FTP. Higher scores represented a more positive perception of the relationship.

RESULTS

The primary goal of the data analyses was to examine whether the effects of attributions on future marital quality were mediated or explained by warm and hostile behavior. In addition, constructs were modeled for both husbands and wives to examine possible dyadic effects. Dyadic data analysis in the structural equation modeling (SEM) framework was used to test the mediation hypothesis.

Correlations

Table 2 shows the correlations among the latent constructs. The correlations revealed several important findings. First, the intrapersonal relationship between attribution (Time 1) and marital quality (Time 3) was significant for both husbands ($r = -.38, p < .001$) and wives ($r = -.24, p < .001$). Second, the intrapersonal correlations between attribution (Time 1) and behaviors (Time 2) were also significant for both husbands ($r = -.47, p < .001$) and wives ($r = -.48, p < .001$). Third, the intrapersonal correlations between behavior (Time 2) and marital quality (Time 3) were significant for

both husbands ($r = .70, p < .001$) and wives ($r = .58, p < .001$). Fourth, the interpersonal correlations between behavior (Time 2) and marital quality (Time 3) were significant for both spouses ($r = .55, p < .001$ between wives’ behavior and husbands’ marital quality, and $r = .54, p < .001$ between husbands’ behavior and wives’ marital quality). In addition, the correlations among parallel constructs between husbands and wives were also significant ($r = .30, p < .001$, between attribution; $r = .84, p < .001$, between behavior; and $r = .56, p < .001$, between marital quality), indicating dyadic association. With these correlations consistent with our expectations, we now turn to the model.

Dyadic Models

Prior to testing this model, the omnibus test of distinguishability (Olsen & Kenny, 2006) demonstrated that husbands and wives were empirically distinguishable; therefore, we proceeded to test this dyadic model without further constraints. Figure 1 shows the results from the APIM. It can be seen that both spouses’ attributions are associated with their own behavior and that spouses’ behavior mutually influenced each other. Thus, one’s own attributions did not influence partner behavior directly. The second part of this model showed the actor and partner effects. For example, the influence of a husband’s behavior on his own marital quality is an “actor effect” whereas the influence of a husband’s behavior on his wife’s marital quality is a “partner effect.” Error terms were correlated for husbands’ behavior and wives’ behavior and for corresponding indicator variables for husbands and wives (e.g., husbands’ selfish attributions with wives’ selfish attributions).

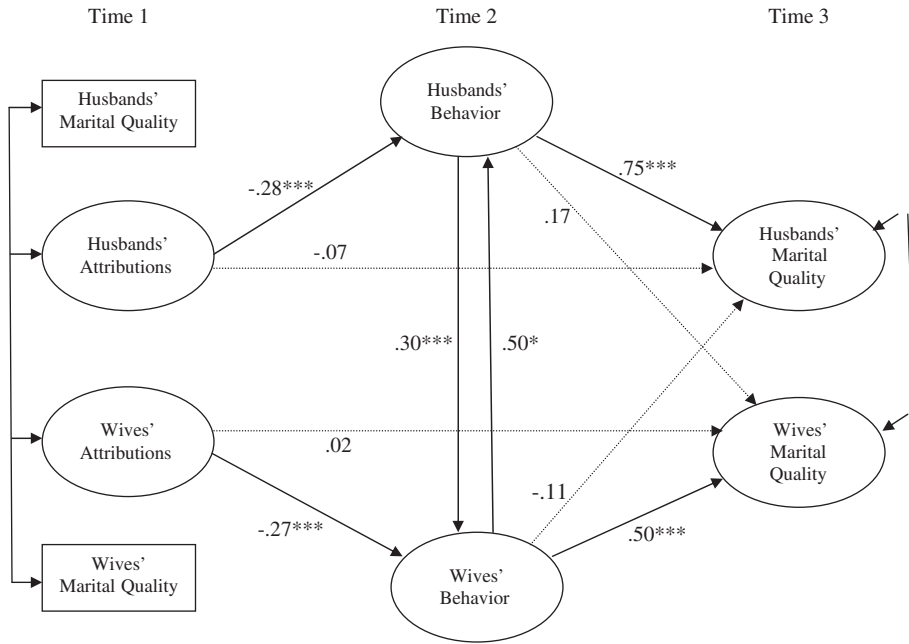
Table 2. Correlations Among Attributions, Behavior, and Marital Quality (N = 280 Couples)

Variables	1	2	3	4	5	6	7	8
1. Wife attributions T1	—							
2. Husband attributions T1	.30***	—						
3. Wife behavior T2	-.48***	-.29***	—					
4. Husband behavior T2	-.35***	-.47***	.84***	—				
5. Wife marital quality T3	-.24***	-.13†	.58***	.54***	—			
6. Husband marital quality T3	-.24**	-.38***	.55***	.70***	.56***	—		
7. Wife marital quality T1	-.37***	-.17*	.47***	.32***	.23***	.22**	—	
8. Husband marital quality T1	-.22**	-.35***	.32***	.36***	.04	.27***	.31***	—

Note: T1 = Time 1, T2 = Time 2, T3 = Time 3. Variables labeled 1–6 are latent variables.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed).

FIGURE 1. ACTOR-PARTNER INTERDEPENDENCE MODEL ACROSS THE FIRST 4 YEARS OF MARRIAGE: ATTRIBUTIONS, BEHAVIOR, AND MARITAL QUALITY.



Note: Standardized solution; $N = 280$ couples. Model fit indices: $\chi^2(263) = 465.07$; CFI = .96; TLI = .95; RMSEA = 0.053 (90% CI = .045, .061); and SRMR = .052. The error terms between husbands' and wives' behavior were correlated, as were each of the error terms for the identical indicators between husbands and wives. This model controlled for husbands' and wives' marital quality at Time 1, and these two control variables have path coefficients to all four endogenous variables, not shown in this figure to ease interpretation of primary results. * $p < .05$. *** $p < .001$ (two-tailed).

Goodness of model fit indices indicated a good fit between the proposed model and the data (Kline, 2005): $\chi^2(263) = 465.07$, Comparative Fit Index (CFI) = .96, Tucker-Lewis Index (TLI) = .95, Root Mean Square Error of Approximation (RMSEA) = .053 (90% confidence interval [CI] = .045, .061), and Standardized Root Mean Square Residual (SRMR) = .052. The standardized factor loadings (not shown) ranged from .30 (the indicator "husbands' observed hostility" loaded on husbands' behavior) to .97 (the indicator "relationship is strong" loaded on the latent variable wives' marital quality).

Figure 1 provides the standardized path coefficients in the model. First, for both husbands and wives the actor paths from their own attributions to their own behavior were significant ($\beta = -.28$, $p < .01$, and $\beta = -.27$, $p < .01$, respectively). Second, the actor paths from behavior to marital quality were significant for

both husbands and wives ($\beta = .75$, $p < .01$, and $\beta = .50$, $p < .01$, respectively). Third, the bidirectional paths from husbands' behavior to wives' behavior ($\beta = .30$, $p < .01$) and from wives' behavior to husbands' behavior ($\beta = .50$, $p < .05$) were both significant. The paths from behavior to partner marital quality were not significant, however. Finally, the direct actor paths from husbands' and wives' initial attributions to their own marital quality 4 years later were no longer significant, unlike the zero-order correlations reported in Table 2.

Tests of Mediating Pathways

Bootstrapping procedures were used to test the mediating effects in this actor-partner interdependence model (see Table 3; Preacher & Hayes, 2008). The actor indirect effects from attributions → behavior → marital quality was significant for wives ($\beta = -.13$, $p < .001$,

Table 3. Mediating Effects for the Actor-Partner Interdependence Model With Attributions as Independent Variables, Behavior as Mediators, and Marital Quality as Outcome Variables; Bootstrap Analyses of the Magnitude and Significance of Mediating Pathways (Standardized Solution; N = 280 Couples)

Predictor	Mediator(s)	Outcome	β	CI	t Value
Wife attribution →	Wife behavior →	Wife marital quality	-.13	-.17, -.09	-6.58***
Husband attribution →	Husband behavior →	Husband marital quality	-.21	-.30, -.13	-5.07***
Wife attribution →	Wife behavior → Husband behavior →	Husband marital quality	-.10	-.17, -.03	-2.76**
Husband attribution →	Husband behavior → Wife behavior →	Wife marital quality	-.04	-.05, -.03	-8.68***

Note: Indirect paths tested with 2,000 bootstraps. CI = 95% confidence interval.

** $p < .01$. *** $p < .001$ (two-tailed).

CI = -.17, -.09) and for husbands ($\beta = -.21$, $p < .001$, CI = -.30, -.13). This can be interpreted for the husbands as follows: When husbands' attributions in early marriage increase 1 standard deviation unit (becoming more conflict promoting), controlling for both spouses initial levels of marital quality, husbands' marital quality 4 years later is predicted to decline 0.21 standard deviation units (on average from the bootstrapping procedure), via its prior effect on husbands behavior.

Similarly, evidence for mediating effects through both actor and partner pathways were also found: Husbands' attributions → husbands' behavior → wives' behavior → wives' marital quality was a significant mediating pathway ($\beta = -.04$, $p < .001$, CI = -.05, -.03). The corresponding pathway of wives' attributions → wives' behavior → husbands' behavior → husbands' marital quality was also significant ($\beta = -.10$, $p < .01$, CI = -.17, -.03). This overall model accounted for 62% of the variance in wives' behavior, 71% of the variance in husbands' behavior, 37% of the variance in wives' marital quality, and 49% of the variance in husbands' marital quality.

We then tested for possible differences between the five corresponding path coefficients for husbands and wives. To do this, we constrained corresponding paths between husbands and wives to be equal, one at a time, while examining chi-square difference tests to see if the model significantly changed. The results indicated that there were no significant differences between any of the corresponding paths between husbands and wives.

DISCUSSION

The present study showed that the relationship between newly married spouses' levels

of responsibility attributions and their marital quality 4 years into the marriage was mediated by behavior toward the spouse 2 years into the marriage. Our findings provide an important insight into the mechanisms through which attributions are associated with marital quality, namely, that attributions predict later behavior and behavior predicts future marital quality for both spouses. Thus, what happens cognitively is expressed behaviorally, which then predicts later overall perceived marital quality. Interestingly, there were no significant direct effects for either husbands' or wives' attributions on their own marital quality 4 years later, once behavior was added to the model. In other words, the relationship between attributions and marital quality was fully mediated through behavior.

The dyadic nature of the analyses also yielded novel findings. Specifically, an interspousal pathway was documented from attributions to own behavior to partner behavior and then to partner marital quality. In other words, each spouse's attributions predict both his or her own future marital quality and the partner's future marital quality through the couple's behavior. We found that one partner's behavior predicted his or her own marital quality (actor effect). Despite the significant correlations between behavior and a partner's marital quality (partner effect), however, a spouse's behavior did not significantly predict the other partner's marital quality in this model, after controlling for one's own behavior, attribution, and marital quality at Time 1. In the zero-order correlation, however (see Table 2), spouse's behavior was significantly correlated with the partner's marital quality. The significant bivariate association was reduced to nonsignificance when other constructs were added in the APIM model. This sample included younger adults who were predominantly highly satisfied in their marriages;

therefore, limited variation in marital quality and behavior could have reduced the likelihood of finding significance in the partner pathway. The present findings suggest that husbands' behavior may affect wives' marital quality through wives' behavior, and wives' behavior may affect husbands' marital quality through husbands' behavior. Further, we also found that even though one partner did not influence the other partner's marital quality directly (partner effect), the association was mediated through the other partner's behavior. These results extend past research by explicating interspousal pathways wherein the attributions spouses make predict behavior and that this behavior, in turn, can predict marital quality for both spouses through the reciprocated behaviors of husbands and wives.

What Does This Mean?

These results are indicative of a relatively straightforward and important process that occurs in romantic relationships that extends our understanding of dyadic processes between and within spouses. In the early stages of marriage, spouses are experiencing the initial phases of the "coupling process" that can have lasting consequences because of the enduring dynamics of the relationship that are established early in the union (Donnellan et al., 2005; Huston, Caughlin, Houts, Smith, & George, 2001). In this early coupling process, spouses are likely developing habitual ways of explaining partner behavior, for example, the reason she does things for me is because she loves me or the reason he forgets things is because he does not care about me. Spouses make many forms of attributions for their partners on a regular basis, including responsibility attributions of intent, selfishness, and blame for partner behavior.

These patterns of meaning making for a spouse are very important in this early stage of marriage because how a spouse thinks about his or her partner predicts how he or she will behave toward that partner. Spouse behavior was measured reliably with both self-report measures of warm and hostile behavior and also observed warm and hostile behaviors. These measured behaviors included such items as expressing appreciation, care, warmth, encouragement, concern, criticism, shouting, acting loving and affectionately, sensitivity, and cooperation. It makes intuitive sense that when one begins to hold more negative cognitions and affect toward a spouse,

this will eventually be manifested through more negative behaviors. As one spouse behaves in a certain manner, this can predict how the other spouse behaves. For example, in this sample, if a husband is behaving kindly toward his wife, she is very likely to respond in a similar manner. Likewise, if a husband is hostile toward his wife, the probability of her displaying a hostile behavior in response increases. This interdependence results in an interactional process that can be predicted by the attributions the spouses have made about each other's behavior. It is interesting that attributions predict spouses' behavior 2 years later, as this coupling process included forging patterns around meaning making for the other spouse that continues to influence behavior well into the future. As couples form attributions that lead to behaviors and interactional patterns, these behaviors then predict each spouse's overall evaluation of how satisfied they are in their relationship and how good they perceive their relationship to be. Perhaps the present findings can be summarized best by altering a popular phrase: sow an attribution for your spouse, reap a behavior; sow a behavior, reap an interactional pattern; sow an interactional pattern and reap your marital quality.

Appropriately addressing marital interactions requires that methodologies and their statistical assumptions match the theory being tested (Hsiung & Bagozzi, 2003). This paper outlined how the actor-partner interdependence model joined with a mutual influence model using bootstrapping procedures can enhance the study of dyadic processes. Analyzing data as if behavior reflects a solely individual process rather than interdependent mechanisms with reciprocal pathways between spouses commits the error of "pseudo-unilaterality" or the error of ascribing to an individual spouse what is really a product of interactions between partners (Duncan, Kanki, Mokros, & Fiske, 1984). This type of incongruence between conceptual analysis and analytic method results in serious violations of statistical assumptions, runs counter to theory, and leads to a biased interpretation of the results (Hsiung & Bagozzi, 2003). The methodologies used in this study appropriately matched the theory being tested. The interdependence between spouses across time was included in the model. Also, the assumption of independence was not violated, as the test of empirical distinguishability indicated husband and wives were empirically distinguishable.

The intraspousal and interspousal pathways worked similarly for both husbands and wives, with no significant differences found between the sexes. These findings contradict earlier results (Bradbury et al., 1996; Bradbury & Fincham, 1992; Fincham, 2001; Miller & Bradbury, 1995) that suggest the association between attributions and behavior is stronger for women than men. These earlier studies and the present study each used similar measures of attributions and observed behavior, but the present study had a sample of 280 couples whereas the others had sample sizes of 60 couples or fewer. The present study used multiple waves of data over 4 years, thus suggesting the possibility that there may be sex differences in this link at a single time point, but that across time these mechanisms work very similarly for wives and husbands. There seemed to be some consensus in the literature that perhaps the association between attributions and behavior and attributions and marital quality was more of a “female phenomenon,” as the effects have been so much smaller or not detected in men (Fincham, 2001). The present results contradict these assumptions by directly testing for differences between parallel pathways in the model for wives and husbands and finding no differences in effect. For example, the strength of the path between attribution and behavior was not significantly different between spouses, nor was the path between behavior and marital quality. In other studies, simply because one pathway was significant for women whereas the same association did not reach significance for men does not indicate a significant sex difference, as may be inappropriately assumed. These results suggest that these mechanisms work similarly for men and women, and this mechanism is just as meaningful for men as women in predicting marital quality.

Limitations

Several limitations of the present study should be noted. First, the original FTP sample is predominantly European American. There is thus a need to replicate and extend these results using more diverse samples to ascertain the generalizability of these findings. Other studies using the FTP have demonstrated generalizability to both urban (e.g., Conger, Patterson, & Ge, 1995) and minority (e.g., Conger et al., 2002) samples, however, thus increasing confidence that the present findings may extend to other demographic groups

as well. Second, although three waves of data collection over 4 years is very informative, more waves of data collection over differing time intervals would be useful in capturing the changes in relationships over time. Third, the couples in the present study were primarily in their 20s, and their marriages were in the early stages. Future research is needed to test this mediation model at different periods of marital development and at differing durations of marriage. To be clear, we are not sure whether the results will generalize to future marital periods other than early marriage or to shorter durations than 2-year intervals. Fourth, couples who were not in relationships with the same partner across the study period were excluded, allowing this study to examine marital process across time with the same partner. These findings, however, may not generalize to those in short relationships or those with different partners. Fifth, the responsibility attributions used in this study were only about negative behaviors from a partner, as opposed to attributions about positive behaviors.

Nonetheless, this study is notable for its relatively large sample size of 280 couples from whom observed and self-reported data were gathered from both husbands and wives over a 4-year period of time at three time points. This methodological design decreased potential shared method variance and eliminated retrospective reporting biases. In addition, we tested self-reported behavior and observed behavior separately, which yielded a similar pattern of results but with differing magnitudes. We used both observed and self-reported measures in this study, however, given that the multiple informant method is preferred. In addition, we provided a direct test of mediation using a mediator that was measured temporally after the predictor and before the outcome variable. Also, given the dearth of research including longitudinal studies of attributions and observed behaviors in early marriage, we believe that our investigation provides much needed data of critical value to understanding dyadic pathways among marital attributions, behavior, and marital quality.

Implications

Notwithstanding the limitations outlined, the present study has important implications for both intervention and future investigation of attributions in marriage. With regard to intervention, the present results suggest that cognitive

interventions designed to increase marital quality that target maladaptive attributions only are unlikely to succeed, as they ignore the mediating role of spouse behavior. Thus, attributions and warm and hostile behavior may be more proximally related, whereas attributions and marital quality may be more distally related through the mediating role of behavior between spouses. Thus, it may prove more useful to look at the whole pattern of interaction, beginning with the cognitive processes that underlie the attributions made for a spouse and the resultant interactional behaviors of the couple. McNulty, O'Mara, and Karney (2008) recently found that the tendency to make positive attributions about negative experiences only demonstrated benefits in healthier marriages. The same attributional propensity predicted steeper declines in marital quality among couples in more troubled marriages. Thus, as marital quality appears to moderate this relationship between attribution and behavior, couples should be assessed for the quality of their relationship prior to intervening to determine if it would be most helpful to start treatment with facilitating change in behavior or attribution. When couples are in a more negative interactional pattern, changing the negative behaviors should also be accompanied with changing the attributions one makes for spouse behavior. Often in couple therapy, a spouse may slightly improve his or her behavior toward a partner, but the partner does not change his or her distress maintaining attributions about the other, which then makes improving the relationship difficult without changes to *both* the attribution and the behavior in each spouse.

Marital treatments will likely benefit from our exploring the entire systemic process of how each spouse interacts with the other, while exploring the often unspoken attributions for a spouse's behavior, as inferred intentions are commonly incorrect (Waldinger & Schulz, 2006). More specifically, treatments that look at both the patterns surrounding the dyadic behavioral exchange *and* the responsibility attributions (intent, selfishness, and blame) ascribed to those behaviors are more likely to facilitate an improved pattern of dyadic behavior and affect. In practice, this can be applied through identifying the negative interactional process between partners and then helping them access and share their unspoken attributions as part of the treatment that allows for behavioral changes and improved understanding between partners.

In future studies, researchers might also consider replicating these results with couples who are cohabiting or dating and with increased relationship duration. Additionally, future research could work on teasing out directionality between attributions and relationship quality in the dyad. To further expand theory development, more frequent assessments of attributions and behavior across the years of couples' relationships could shed more light on these dyadic processes. Future research could examine the effects of attributions about positive behaviors on relationship functioning. Also, instead of treating attributions as exogenous, future studies could further examine the origins and formations of these attributions (e.g., family of origin and negative and positive life events).

Conclusion

The present study advanced theoretical development by providing empirical support for the view that one's attributions predict future behavior, which, in turn, predicts future marital quality. Spousal behavior was mutually influencing allowing attributions from each spouse to ultimately influence not only themselves but also their spouses' marital quality across time indirectly through behaviors. Interestingly, these direct and indirect pathways worked in identical manners for both husbands and wives and did not differ by sex. Methodologically, dyadic modeling was a useful couple data-analytic strategy for examining individual and interpersonal processes over time (Kenny et al., 2006). Implementing a dyadic model as a data-analytic strategy enhanced our understanding of individual and interpersonal processes underlying couples' attributions, behavior, and marital quality. This study is among the first to model attributions, behavior, and marital quality at a dyadic level and suggests that interventions targeted at improving marital quality can be enhanced by understanding these underlying intraspousal and interspousal processes, allowing clinicians to be theoretically guided in their assessment and treatment of couple dissatisfaction.

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