

# Anxiety Disorders and Intimate Relationships: A Study of Daily Processes in Couples

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Although adults with anxiety disorders often report interpersonal distress, the degree to which anxiety is linked to the quality of close relationships remains unclear. The authors examined the relational impact of anxiety by sampling the daily mood and relationship quality of 33 couples in which the wife was diagnosed with an anxiety disorder. Use of a daily process design improved on prior methodologies by capturing relational processes closer to their actual occurrence and in the setting of the diagnosed partner's anxiety. Analyses revealed significant associations between wives' daily anxiety and both partners' perceptions of relationship quality. Associations were moderated by anxiety-specific support. Results also indicated significant concordance between wives' daily anxiety and husbands' distress. Concordance was stronger for husbands who reported frequent accommodation of wives' anxiety symptoms. Findings are discussed in the context of existing evidence on the social costs of anxiety disorders.

*Keywords:* anxiety disorders, couples, marriage, marital distress, relationship functioning

Intimate relationships are a primary context in which adults express and manage personal distress. The study and treatment of depression in particular have benefited from increased recognition of its interpersonal consequences (Beach, Whisman, & O'Leary, 1994). In comparison, we have far more limited knowledge of how anxiety disorders operate in close relationships. Little is known about the impact on the significant other of living with a partner who suffers from persistent and chronic anxiety. Given the degree of social and functional impairment often accompanying these disorders (e.g., Bystritsky et al., 2001), the current study sought to clarify how the presence of an anxiety disorder impacts the relational life of a couple.

## Are Anxiety Disorders Associated With Relationship Distress?

Population studies point to strong associations between an anxiety disorder in one partner and perceptions of poor marital quality by both partners (e.g., McLeod, 1994). A longitudinal analysis of 4,796 married couples indicated that baseline marital quality was a strong predictor of the onset of an anxiety disorder over a subsequent 2-year period (Overbeek et al., 2006). Recent data from the National Comorbidity Survey Replication have also demonstrated that marital distress is significantly associated with in-

creased risk of having any concurrent anxiety disorder, particularly social anxiety disorder (SAD), generalized anxiety disorder (GAD), and posttraumatic stress disorder (PTSD; Whisman, 2007). The association between anxiety disorders and poor marital functioning does not appear to be an artifact of general social impairment (Whisman, Sheldon, & Goering, 2000) and is not better accounted for by age, gender, or comorbidity with depression or with alcohol or drug dependence (McLeod, 1994; Whisman, 1999, 2007). Moreover, adults with anxiety disorders may engage in interpersonal behaviors that elicit poor reactions from others or jeopardize opportunities for support and intimacy (e.g., Darcy, Davila, & Beck, 2005).

Prior research in this area has taken a predominantly nomothetic approach, in which associations between anxiety disorders and marital quality were examined across a group of individuals. These data tell us that, on average, adults with anxiety disorders are likely to experience poor relationship quality. However, it remains unknown whether a person affected by an anxiety disorder is more or less likely to experience relational difficulties on those occasions when he or she experiences elevated anxiety. Tennen, Affleck, Armeli, and Carney (2000) cautioned against using cross-sectional, between-person associations to draw inferences about how two variables are related within the same person. It is possible, for instance, that adults with anxiety disorders experience *improved* relationship quality during episodes of heightened anxiety because of increased support received from an intimate partner at this time.

In developing theoretical models and designing interventions, clinicians and researchers rely on idiographic formulations of how these processes unfold for a given person. Over the last decade, there have been significant advances in the procedural and analytic tools available to study idiographic processes over time. In particular, the daily diary method has proven to be a useful way to examine how two processes (e.g., marital quality and anxiety) covary within the same person over time. In the present study,

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daily diary reports were used to determine the within-person association between anxiety and relationship quality among adults with anxiety disorders and their partners.

One limitation of prior literature on anxiety disorders and relationship quality is the inconsistency across studies in how relationship quality is defined. Daiuto, Baucom, Epstein, and Dutton (1998) argued that it is important to distinguish relationship *satisfaction* (i.e., subjective appraisal of how happy one is in a relationship) from relationship *adjustment* (i.e., the quality of specific relational processes such as communication or problem-solving). The utility of this distinction is supported by previous studies showing that aspects of relationship adjustment (e.g., avoidance of communication) significantly predicted the outcome of treatment for an anxiety disorder, even when global relationship satisfaction was high (Craske, Burton, & Barlow, 1989; Marceau, Belanger, & Marchand, 2003). Exclusive reliance on global evaluations of relationship satisfaction may therefore miss clinically useful information about areas of relationships more or less disrupted by anxiety. Even when couples describe their relationships as high functioning across multiple domains, couples who struggle to accommodate one partner's anxiety symptoms (e.g., with effective support and communication) may experience more pronounced relational impact in the context of these symptoms (Craske et al., 1989). In observed interactions between agoraphobic women and their husbands, problem-solving difficulties were greater when the topic of discussion was the wife's anxiety (Chambless, Bryan, Aiken, Steketee, & Hooley, 2001). In the present study, we used a measure of anxiety-specific relationship adjustment to provide a contextually sensitive assessment of relationship functioning. We hypothesized that anxiety-specific relationship adjustment would be more informative in predicting the strength of the association between anxiety and daily relationship quality than would a measure of global relationship functioning.

### What Is the Experience of the Significant Other?

Research on the interpersonal consequences of depression highlights the adverse effects of one partner's mood disturbance on another (Joiner & Katz, 1999). The tendency to "catch" another person's distress is referred to as *emotional contagion* and has been supported extensively in social psychology (e.g., Hatfield, Cacioppo, & Rapson, 1994) as well as in the literature on depression (Katz et al., 1999). Spouses of depressed partners show higher levels of depressed mood than do controls, with a substantial portion carrying levels of distress that warrant clinical intervention (Benazon & Coyne, 2000; Coyne et al., 1987). Yet data on the concordance of anxiety in dyads is sparse. One study found that displays of anxiety elicited high levels of distress, rejection, and devaluation from others, with some evidence for affect-specific mood induction (Gurtman, Martin, & Hintzman, 1990). However, most studies in this area used nonclinical samples and did not examine these phenomena in the context of intimate relationships. Adults who meet diagnostic criteria for an anxiety disorder may be more likely to show dyadic concordance in distress than nonclinical groups, perhaps as a function of the severity, chronicity, and perceived unmanageability of their anxiety (e.g., Joiner & Katz, 1999). A second focus of the current study was therefore to examine the degree to which one partner's anxiety is associated with elevated distress in the partner.

We were further interested in specifying conditions that strengthen this concordance in distress. Studies examining familial responses to a relative with an anxiety disorder have identified response styles that may contribute to shared distress (Calvocoressi et al., 1995). For example, Amir, Freshman, and Foa (2000) found that the degree of distress felt by relatives of patients with obsessive-compulsive disorder (OCD) was significantly related to how frequently they accommodated the patient's symptoms and how critical or rejecting they felt toward the patient. Geffken et al. (2006) similarly reported that high levels of family accommodation to OCD patients' symptoms was strongly related to relatives' disengagement and denial in the face of stressful situations. In the present study, we examined whether adults with anxiety disorders were more likely to transmit distress to their partners when their partners featured certain habitual response styles, such as hostility and rejection, or symptom accommodation.

### The Current Study

We observed associations between anxiety and relationship quality (RQ) among couples in which one partner (the wife) was diagnosed with an anxiety disorder. We used a daily process design to improve on prior studies that relied on cross-sectional, between-person analyses. Specifically, we hypothesized that:

1. Wives' daily anxiety would be associated with daily perceptions of RQ for both partners.
2. The associations between wives' anxiety and perceptions of RQ would be moderated by wives' anxiety-specific, but not global, relationship adjustment. We hypothesized that associations would be stronger for couples with lower anxiety-specific relationship adjustment.
3. On days in which wives reported elevations in anxious mood, husbands would be perceived as having at least some involvement in their wives' anxiety. Exploratory analyses examined how often husbands were perceived as contributing to the (a) reason for anxiety, (b) worsening of anxiety, or (c) alleviation of anxiety.
4. Wives' daily anxiety would be associated with husbands' level of distress (i.e., anxiety, anger, depression) on the same day.
5. The association between wives' anxiety and husbands' levels of distress would be moderated by (a) husband-reported hostility toward the wife and (b) husband's accommodation of wives' anxiety symptoms. We hypothesized that wives' anxiety would be more strongly associated with husbands' distress for husbands who report greater hostility and greater accommodation of wives' symptoms.

### Method

#### Participants

Our sample consisted of 33 married and/or cohabiting ( $\geq 6$  months) heterosexual couples in which the female partner met

*Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) criteria for a principal anxiety disorder. Exclusion criteria included evidence of psychosis, risk of self-harm, partner abuse, alcohol or substance abuse in the last 6 months, an organic mental disorder, or a history of bipolar disorder. Couples were excluded if the diagnosed partner met criteria for a current major depressive episode to minimize the potentially confounding effects of comorbid depression.

Participants were recruited from four sites in the Philadelphia area: (a) the Adult Anxiety Clinic of Temple University ( $n = 16$  couples; 47.1%), (b) the Psychological Services Center of Temple University ( $n = 7$ ; 20.6%), (c) the Anxiety and Agoraphobia Treatment Center ( $n = 4$ ; 11.8%), and (d) the Temple University student body ( $n = 7$ ; 20.6%) during 2004–2005.

The majority of couples ( $n = 21$ ; 62%) were married ( $M = 7.6$  years,  $SD = 8.7$ ) or cohabiting for a mean duration of 3.04 years ( $SD = 2.0$ ). The average age was 33.8 years ( $SD = 10.3$ ). Participants were predominantly Caucasian (61.8%), with 17.6% identified as African American, 2.9% Hispanic, 8.8% Asian/Asian American, and 8.8% Other. Analysis of variance for age and chi-square analyses for categorical variables revealed site differences in the age of the diagnosed partner, Welch  $F(3, 10) = 7.30$ ,  $p < .05$ , and the frequency of married versus cohabitating and unmarried couples,  $\chi^2(3, N = 66) = 19.89$ ,  $p < .05$ . None of these variables were significantly related to mean aggregated scores on daily measures of mood or relationship quality or baseline measures of relationship adjustment.

## Procedure

Married or cohabiting adults seeking psychotherapy at the clinics listed above were contacted by a research assistant about a study on “relationships and stress.” Students were contacted if they endorsed being married or living with a significant other. All prospective participants were administered a telephone screening interview by a master’s-level clinician to inquire about the presence of anxiety disorder symptoms and to evaluate exclusion criteria. Those who endorsed clinically significant anxiety disorder symptoms in this phone interview were invited to complete a face-to-face diagnostic interview with a master’s-level clinician.

Couples who met study criteria and provided informed consent were given baseline questionnaires and 14 diary reports. Partners were instructed to complete diary reports separately at the end of each day, to refrain from discussing their responses, and to return each report in a prestamped envelope after completion. Compliance was monitored in two ways: (a) Couples were phoned once at the end of each study week to remind them to complete questionnaires separately, give them an opportunity to ask questions, and encourage consistent mailing of reports; (b) on each diary, participants were asked to indicate whether they completed the report on a day other than the one designated on the form. At study completion, couples were debriefed and given \$100.00 remuneration.

Of 34 couples (i.e., 68 participants) enrolled, 91.2% ( $n = 31$ ) of wives and 91.2% ( $n = 31$ ) of husbands provided 14 daily reports. The mean number of data points provided was 13.8 (range = 12–14;  $SD = 0.41$ ) for wives and 13.76 (range = 10–14;  $SD = 0.81$ ) for husbands. Baseline questionnaires were completed by all participants. One couple was eliminated because more than half of their reports were noncompliant (completed on an incorrect day).

Eight additional couples had noncompliant reports ( $M = 2$ , range = 1–3). Rather than eliminate their data, we omitted from our analyses their noncompliant days (19 total). Our final sample was therefore 33 couples.

## Baseline Measures for Wives

**Anxiety Disorders Interview Schedule for *DSM-IV* (ADIS-IV; Brown, DiNardo, & Barlow, 1994).** The ADIS-IV is a semistructured clinical interview used to assess the presence of current *DSM-IV* anxiety, mood and substance-use disorders among adults. In this study, anxiety, mood and substance-use modules were administered to determine diagnostic status as well as the presence of comorbid disorders. Brown, DiNardo, Lehman, and Campbell (2001) reported good to excellent reliability for the diagnosis of a principal anxiety disorder ( $\kappa = .67$ –.86). Interviewers were advanced doctoral students trained to the exacting standards specified by Brown et al. (2001). Interviews were audiotaped to avoid observer drift and half of the interviews were randomly selected for rerating by the investigator. Excellent interrater reliability was demonstrated for the Clinician’s Severity Rating associated with the primary diagnosis of an anxiety disorder (intraclass correlation coefficient [ICC] = .87).

**Couples Interaction Questionnaire (CIQ; Craske et al., 1989).** The CIQ, a measure of anxiety-specific relationship adjustment, inquires about the degree of communication, understanding, and support perceived by wives when they experience anxiety. Total scores range from 0 (*poorest relationship adjustment*) to 30 (*highest relationship adjustment*). Craske et al. (1989) reported weak correlations between the CIQ and patient-reported marital happiness, suggesting that this measure captures aspects of relationship adjustment that are distinct from global measures of marital satisfaction. Cronbach’s alpha was .82 in this sample.

## Baseline Measures for Husbands

**Family Accommodation Questionnaire—Modified (FAQ-M).** The FAQ-M is a modified version of the Family Accommodation Questionnaire (FAQ; Calvocoressi et al., 1995), a 13-item self-report measure originally developed to assess the frequency of accommodating behavior in response to a family member with OCD. To make the FAQ applicable to the broader class of anxiety disorders, the wording of items was changed to refer to “anxiety symptoms” rather than “obsessive-compulsive disorder,” and OCD-specific items (e.g., “How often did you provide objects for your partner’s compulsions?”) were removed. The FAQ-M assessed husbands’ participation in symptom-related behavior, changes in routine due to wives’ anxiety symptoms, and distress caused by symptom accommodation. The original FAQ correlated highly with relevant subscales of the Questionnaire on Resources and Stress for Families with Chronically Ill or Handicapped Members (Calvocoressi et al., 1995). Alpha in our sample was .82.

**Patient Rejection Scale (PRS; Kreisman, Simmens, & Joy, 1979).** The PRS is an 11-item questionnaire assessing family hostility, a central component of expressed emotion and a demonstrated predictor of relapse (Hooley, 1985). Items are statements concerning the husband’s perceptions of the wife (e.g., “I get more

irritated with her as time goes on"). Husbands were asked to rate the frequency with which these statements apply to them on a scale from 0 (*never*) to 2 (*often*). Items were summed to calculate a total score. Alpha in our sample was .60.

Husbands completed two additional questionnaires assessing levels of anxiety, depression and general psychological distress:

**The State-Trait Anxiety Inventory: Trait version (STAI-T; Spielberger, 1983).** A 20-item scale used to assess the degree to which husbands feature a stable tendency to experience anxiety and depression. The trait scale of the STAI has been shown to have high convergent validity and test-retest reliability (Spielberger, 1983). Bieling, Antony, and Swinson (1998) identified two subscales of the STAI-T: (a) STAI-D (13 items), which loaded highly on a depression-content trait factor, and (b) STAI-A (seven items), which loaded highly on an anxiety-content trait factor. In the present sample, alphas for the STAI-D and STAI-A were .90 and .71, respectively.

**The Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983).** A 90-item measure of psychological symptom distress in the past week, with each item rated on a 5-point Likert scale from 0 (*not at all*) to 4 (*extremely*). We used the Global Severity Index (GSI), a mean score of all responses, to reflect levels of general symptom distress among husbands. Raw GSI scores of 0.57 or above have been shown to reflect clinically significant symptom distress (Schauenburg & Strack, 1999). Alpha was .88.

### Baseline Measure for Both Spouses

**Dyadic Adjustment Scale (DAS; Spanier, 1976).** The DAS is a widely used 32-item measure of global relationship quality. The summed total score, which ranges from 0 to 151 (higher scores reflect better functioning), was used to characterize global relationship functioning. Alpha was .90 for the total sample (.91 wives, .89 husbands).

### Daily Measures

All standard deviations reported below and in Table 1 for the diary measures represent within-subject variation, not a combination of variation over days and participants. The reliability of these scales represents within-person consistency (reliability of change; Cranford et al., 2006). See Table 1 for means, standard deviations, and reliabilities and Table 2 for intercorrelations between daily measures.

**Affects Balance Scale (ABS; Derogatis, 1975).** The ABS is a multidimensional mood and affect measure consisting of 40 feeling words that cluster into specific emotional domains. Six factors emerged in a factor analysis using data from a psychiatric population (Derogatis & Rutigliano, 1996). Among these were four lower order negative affect dimensions, three of which were used in the present study: anxiety, anger/hostility, and depression. Each subscale consisted of five items, each rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*very much*). Items were summed across each day to produce a daily subscale score for each dimension of affect.

**Perceived involvement in wives' anxiety.** Wives who endorsed at least moderate anxiety (i.e., responses above 0 for anxiety-associated items) were asked to respond to three related questions about the degree and nature of the husbands' contribution to their anxiety. Specifically, wives were asked to rate on a 4-point scale (where 0 represents *not at all* and 3 represents *very much*) the degree to which they felt their partner had something to do with causing, worsening, or alleviating their anxiety that day.

**Relationship Quality (RQ).** Each partner was asked to rate positive and negative relationship qualities on the day of reporting. Items were adapted from interview questions used by McLeod (1994). Based on a factor analysis of 11 measures of marital quality, McLeod (1994) identified two indices with good internal consistency: a 5-item index of positive RQ (e.g., "partner showed concern," "partner was dependable") and a five-item index of

Table 1  
Descriptive Statistics for Baseline and Diary Measures for Wives and Husbands

Measure	Wives		Husbands		<i>t</i> (32) <sup>a</sup>	Reliability <sup>b</sup>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		Wives	Husbands
Dyadic Adjustment Scale	107.52	14.68	107.91	13.17	-0.20		
CIQ	25.18	7.04	—	—			
STAI-Anxiety	—	—	12.90	3.02			
STAI-Depression	—	—	24.68	6.57			
FAQ-M	—	—	17.55	7.40			
Patient Rejection Scale	—	—	16.06	2.68			
Symptom Checklist-90	—	—	0.55	0.51			
Diary measures							
Anxiety	5.71	2.82	2.44	1.95	17.8**	.79	.69
Anger/hostility	3.24	2.86	2.21	2.37	5.38***	.82	.80
Depression	3.38	2.99	1.64	2.02	9.38***	.85	.79
Positive RQ	9.26	2.84	8.80	2.61	1.98*	.82	.82
Negative RQ	2.82	3.07	3.34	2.86	-2.62**	.86	.82

Note. CIQ = Couples Interaction Questionnaire (Craske et al., 1989); STAI = State Trait Anxiety Inventory (Spielberger, 1983); FAQ = Family Accommodation Questionnaire—Modified; RQ = relationship quality. Standard deviations of diary measures reported here are the within-person deviations. Table cells containing dashes are those for which questionnaires were not completed (some questionnaires were filled out by husbands but not wives, hence no data in the "wives" column).

<sup>a</sup> Means were compared using a multilevel approach to account for within-dyad dependencies. <sup>b</sup> Reliability coefficients were calculated using the generalizability approach for diary measures described by Cranford et al. (2006). Denoted as  $R_{\text{change}}$ , these figures capture within-person reliability.

\*  $p < .05$ . \*\*  $p < .001$ .

Table 2  
Mean Within-Dyad Correlations of Daily Variables<sup>a</sup>

Variable	1	2	3	4	5	6	7	8	9
1. Wives' anxiety	—								
2. Wives' anger/hostility	.46**	—							
3. Wives' depression	.52**	.61**	—						
4. Wives' positive RQ	-.01	-.19*	-.07	—					
5. Wives' negative RQ	.19**	.38**	.28**	-.52**	—				
6. Husbands' anxiety	.17**	.23**	.24**	-.04	.06	—			
7. Husbands' anger/hostility	.15**	.27**	.25**	-.16**	.20**	.40**	—		
8. Husbands' depression	.18**	.29**	.27**	-.11	.18*	.42**	.64**	—	
9. Husbands' positive RQ	-.10	-.22**	-.23**	.21**	-.21**	-.08	-.24**	-.21**	—
10. Husbands' negative RQ	.09	.21*	.25**	-.25**	.35**	.27**	.47**	.42**	-.47**

Note. RQ = relationship quality.

<sup>a</sup> Correlations were calculated within-dyad (across days) and then averaged across couples. To test whether the average correlation was different from zero, we used a one-sample *t* test with couple as the unit of analysis (*df* = 32).

\* *p* < .05. \*\* *p* < .001.

negative RQ (e.g., “partner was demanding,” “partner was critical”). Items were rated on a 4-point scale ranging from 0 (*not at all*) to 3 (*very much*) and summed to produce subscale scores of positive and negative RQ.

## Results

### Description of Sample

Wives featured the following primary anxiety disorders: panic disorder with agoraphobia (PDA; *n* = 2; 6%), GAD (*n* = 9; 27.2%), SAD (*n* = 15; 45.5%), OCD (*n* = 5; 15.1%), and PTSD (*n* = 2; 6%). The majority were receiving treatment for their anxiety (84.8% in psychotherapy, 24.2% receiving psychotropic medication), although most were enrolled in this study during the first 3 weeks of their current treatment (*n* = 24; 85.7%). Ten (30.3%) met criteria for comorbid dysthymic disorder, and 19 (57.6%) met criteria for at least one additional anxiety disorder, including GAD (*n* = 4), SAD (*n* = 11), PDA (*n* = 1), PTSD (*n* = 2), and anxiety disorder not otherwise specified (*n* = 1). Husbands' mean scores on the STAI-A (*M* = 12.90, *SD* = 3.02) and the STAI-D (*M* = 24.67, *SD* = 6.57) subscales were comparable to those reported by Bieling and colleagues (1998) for their control sample (STAI-A *M* = 10.20, *SD* = 2.45; STAI-D *M* = 23.18, *SD* = 4.58). Husbands' mean raw score on the SCL-90 GSI subscale (*M* = 0.55, *SD* = 0.12) was below the clinical threshold suggested by Schauenburg and Strack (1999), with the majority of husbands (73.5%) scoring below the cut-off. Although husbands' diagnostic status was not formally assessed, they did not demonstrate generally elevated levels of psychological distress.

Wives and husbands reported nearly identical levels of global relationship satisfaction on the DAS (see Table 1). Total DAS scores were comparable to those reported for a sample of agoraphobic married and cohabiting women (*M* = 103.2, *SD* = 17.2; Chambless et al., 2001). Based on empirically established cutoffs (i.e., 98; Eddy, Heyman, & Weiss, 1991), 29.5% of couples in the current sample had at least one partner who scored within the distressed range of marital functioning. Mean levels of daily negative mood aggregated across the study period were significantly higher for wives than for husbands, as would be expected given

wives' clinical status. ICCs, representing the proportion of variance between-persons indicated that significant variability existed between and within persons on affect measures for wives (anxiety ICC = .44; anger ICC = .34; depression ICC = .40) and husbands (anxiety ICC = .42; anger ICC = .33; depression ICC = .31).

### Hypothesis 1. Wives' Daily Anxiety Will Be Associated With Perceptions of RQ for Both Husband and Wife

We used a multilevel statistical model to investigate these associations separately for positive and negative RQ. Multilevel modeling accounts for the bias in standard errors and statistical tests that result from nonindependent data and effectively handles “unbalanced” or missing data at the level of repeated observations by using all available data for participants. Inferences are valid assuming missing data are missing at random (see Schafer & Graham, 2002). The models had two levels: within-dyad (over time) and between-dyad. Using the dyadic longitudinal approach described by Bolger and Shrout (2007), we included wives' and husbands' RQ in a single multilevel analysis to account for the fact that wives' and husbands' data were clustered within dyad. All analyses were conducted using the MIXED procedure in SAS (Version 9.1.3, 1997).

The within-dyad level of the analysis allowed each dyad's RQ to be modeled as a function of husbands' and wives' anxiety. We predicted a given day's husbands' and wives' RQ for a particular dyad and adjusted for number of days in the study and weekend effects. Because husbands' anxiety may be highly associated with husbands' evaluations of RQ, husbands' anxiety was included to adjust for this effect. The model specified was as follows:

$$\begin{aligned}
 Y_{ijk} = & (\text{Wife}_{ijk}) \times (b_{0w} + b_{1w}\text{Days}_{ik} + b_{2w}\text{Weekend}_{ik} \\
 & + b_{3w}\text{WANx}_{ik} + b_{4w}\text{HANx}_{ik} + e_{ijk}) + (\text{Husb}_{ijk}) \times (b_{0h} \\
 & + b_{1h}\text{Days}_{ik} + b_{2h}\text{Weekend}_{ik} + b_{3h}\text{WANx}_{ik} + b_{4h}\text{HANx}_{ik} + e_{ijk}),
 \end{aligned}
 \tag{1}$$

where  $Y_{ijk}$  is the RQ for dyad *i* for person *j* (*j* = 1 is wife's report; *j* = 2 is husband's report) on day *k*. When the outcome is the

wife’s report (Wife<sub>ijk</sub> = 1 and Husb<sub>ijk</sub> = 0), the first part of the model is selected and all of the *b* coefficients have the subscript *w*. Similarly, when the outcome is the husband’s report, Wife<sub>ijk</sub> = 0, Husb<sub>ijk</sub> = 1, and the second part of the model is selected. Days<sub>ik</sub> is the number of days in the study; Weekend<sub>ik</sub> indicates whether it is a weekend day or not; WAnx<sub>ik</sub> is the wife’s report of anxiety; HAnx<sub>ik</sub> is the husband’s report of anxiety; the residual components are represented by *e*<sub>ijk</sub>. All predictor variables were within-person centered (Raudenbush & Bryk, 2002). Finally, the approach discussed by Bolger and ShROUT (2007) allowed us not only to account for dependency within individuals across time (i.e., autoregressive) but also to account for dependency within dyads (pp. 292–295).

The between-dyad level of this analysis modeled individual differences in the coefficients specified in Equation 1. We fit a model that considered intercepts for both wives’ and husbands’ reports of RQ to be random (i.e., varying across persons). In addition, slope of day on wives’ RQ (*b*<sub>1w</sub>), slope of wives’ anxiety on wives’ RQ (*b*<sub>3w</sub>), and slope of husbands’ anxiety on husbands’ RQ (*b*<sub>4h</sub>) were modeled to be random for the positive RQ analysis; slope of husbands’ anxiety on husbands’ RQ (*b*<sub>4h</sub>) was modeled to be random for the negative RQ analysis.<sup>1</sup> Random effects were tested using the nested comparison of likelihood ratio (Singer & Willett, 2003, p. 119).

Table 3 presents results for both wives’ and husbands’ reports of positive RQ.<sup>2</sup> Only variables of interest are reported here. Wives’ anxiety was not associated with their own positive RQ, *b*<sub>3w</sub> = -0.03, *t*(32) = -0.89, *ns*, but was significantly associated with husbands’ positive RQ, *b*<sub>3h</sub> = -0.14, *t*(32) = -3.05, *p* < .01. Specifically, on days when wives experienced higher anxiety, husbands reported less positive relationship quality. There was no significant variation around these effects.

Table 4 presents results for wives’ and husbands’ reports of negative RQ. Wives’ anxiety was associated with wives’ negative RQ, *b*<sub>3w</sub> = 0.21, *t*(32) = 4.22, *p* < .01, such that on the days when wives reported higher levels of anxiety, they also reported more negative RQ. However, wives’ anxiety was not associated with husbands’ negative RQ, *b*<sub>3h</sub> = 0.07, *t*(32) = 1.55, *ns*. There was no significant variation around these effects.

Table 3  
Multilevel Analysis Results Relating Daily Anxiety to Positive Relationship Quality (RQ) for Wives and Husbands

Variable	Fixed effects		Random effects	
	γ	SE	τ	LR test
Wives’ positive RQ				
Wives’ anxiety	-0.05	0.06	<sup>a</sup>	
Husbands’ anxiety	-0.01	0.07	<sup>a</sup>	
Husbands’ positive RQ				
Wives’ anxiety	-0.14**	0.05	<sup>a</sup>	
Husbands’ anxiety	-0.11	0.09	0.09*	5.40

Note. The likelihood ratio (LR) test represents the difference between the -2 log likelihood of a model that treats the effect of a particular coping strategy as random and a model that does not.

<sup>a</sup> There was no significant variation around this fixed effect.

\* *p* < .05. \*\* *p* < .001.

Table 4  
Multilevel Analysis Results Relating Daily Anxiety to Negative Relationship Quality (RQ) for Wives and Husbands

Variable	Fixed effects		Random effects	
	γ	SE	τ	LR test
Wives’ negative RQ				
Wives’ anxiety	0.21**	0.05	<sup>a</sup>	
Husbands’ anxiety	0.09	0.07	<sup>a</sup>	
Husbands’ negative RQ				
Wives’ anxiety	0.07	0.05	<sup>a</sup>	
Husbands’ anxiety	0.46**	0.09	0.10**	11.90

Note. The likelihood ratio (LR) test represents the difference between the -2 log likelihood of a model that treats the effect of a particular coping strategy as random and a model that does not.

<sup>a</sup> There was no significant variation around this fixed effect.

\*\* *p* < .001.

### Hypothesis 2. The Associations Between Wives’ Anxiety and Perceptions of RQ Will Be Moderated by Wives’ Anxiety-Specific Relationship Adjustment (CIQ), but Not Global Relationship Functioning (DAS)

We tested the moderation hypothesis in two separate multilevel analyses. The same model described in Equation 1 was used for each analysis. However, Level 2 equations included the following additional predictors as moderators: CIQ and DAS. Because we were interested in the effects of wives’ anxiety on wives’ and husbands’ relationship quality (denoted as *b*<sub>3w</sub> and *b*<sub>3h</sub> in Equation 1, respectively), *b*<sub>3w</sub> and *b*<sub>3h</sub> were modeled as a function of these moderators, as such:

$$b_{3w} = \gamma_{30w} + \gamma_{31w}(\text{CIQ}_{wi}) + \gamma_{32w}(\text{DAS}_{wi}); \quad (2)$$

$$b_{3h} = \gamma_{30h} + \gamma_{31h}(\text{CIQ}_{wi}) + \gamma_{32h}(\text{DAS}_{wi}). \quad (3)$$

CIQ<sub>wi</sub> reflects wives’ report of anxiety-specific relationship adjustment for dyad *i*, and DAS<sub>wi</sub> reflects wives’ report of global relationship functioning. We did not alter the specifications of the random effects for the moderation tests.

CIQ scores moderated the within-person association between wives’ anxiety and their own ratings of positive relationship quality that same day,  $\gamma_{31w} = 0.017$ , *t*(32) = 2.57, *p* < .05, such that for wives who reported low CIQ scores, their anxiety was negatively associated with their positive RQ. For wives who reported high CIQ scores, their anxiety was not associated with their positive RQ. Figure 1 is the visual representation of this interaction, for CIQ scores one standard deviation above and below the mean.

<sup>1</sup> We modeled every coefficient specified in Equation 1 as random. Random effects of intercepts, slope of wives’ day on wives’ positive RQ, slope of wives’ anxiety on wives’ positive RQ, slope of husbands’ anxiety on husbands’ positive RQ, and husbands’ anxiety on husbands’ negative RQ were significant using the nested comparison of likelihood ratio. Thus, our final analyses specified these coefficients to be random, but other random effects were constrained to be zero to simplify our model.

<sup>2</sup> There is little consensus in the literature on the accuracy and interpretation of effect size calculations for multilevel models. We therefore decided it was most conservative not to report them in this study.

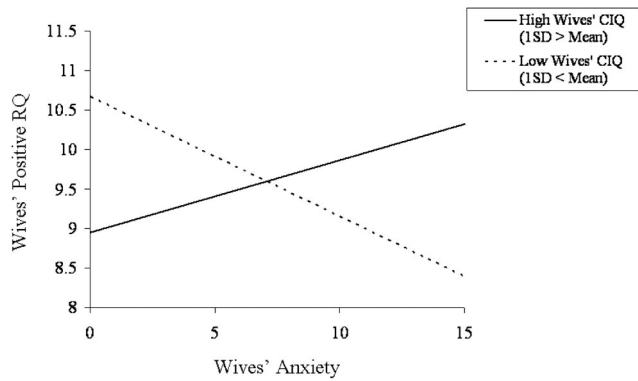


Figure 1. Prediction of wives' relationship quality (RQ) with wives' anxiety as a function of high and low Couples Interaction Questionnaire (CIQ; Craske et al., 1989) scores.

CIQ scores did not moderate any other hypothesized within-dyad associations, Positive RQ:  $\gamma_{31h} = 0.001, t(32) = 0.17, ns$ ; Negative RQ:  $\gamma_{31w} = -0.006, t(32) = -0.89, ns$ ;  $\gamma_{31h} = 0.005, t(32) = 0.79, ns$ . As hypothesized, DAS did not moderate the association between anxiety and negative or positive RQ, Positive RQ:  $\gamma_{32w} = 0.005, t(32) = 0.60, ns$ ;  $\gamma_{32h} = 0.004, t(32) = 0.52, ns$ ; Negative RQ:  $\gamma_{32w} = -0.011, t(32) = -1.20, ns$ ;  $\gamma_{32h} = -0.010, t(32) = -1.24, ns$ .

**Hypothesis 3. On Days in Which the Wives Reported Elevations in Anxious Mood, Husbands Will Be Perceived as Having at Least Some Involvement in the Experience of Anxiety**

We identified all days on which wives reported at least moderate anxiety (2 or 3 on a 0–3 scale). We then examined the frequency, across all these days, of moderate to high (2 or 3 on a 0–3 scale) ratings on follow-up questions concerning the husbands' influence on the wives' anxiety that day. Wives reported at least moderate anxiety on an average of 10 of 14 days (range = 6–14). On 60.5% of these occasions, wives perceived their husbands as having at least some (ratings of 2 or 3 on a 0–3 scale) influence on their anxiety that day. On 44.4% of these days, husbands were perceived as improving the wife's anxiety; on 17.4% of days, husbands were perceived as making the wife's anxiety worse; and on 38.4% of days, husbands were perceived as neither making the anxiety better nor worse. A one-way chi-square test revealed significant differences in the proportions of each type of rating (i.e., anxiety made better, worse or neither) represented across all high-anxiety days,  $\chi^2(2, N = 66) = 36.69, p < .05$ .

**Hypothesis 4. Wives' Anxiety Will Be Associated With Higher Levels of Husbands' Distress (i.e., Anxiety, Anger, Depression)**

We again used multilevel modeling to investigate these associations. However, we were only interested in husbands' distress as our outcome, as follows:

$$HAnx_{ik} = b_{0i} + b_1Days_{ik} + b_2Weekend_{ik} + b_3WANx_{ik} + e_{ijk} \tag{4}$$

As indicated previously, we specified the variance–covariance matrix as autoregressive. Each distress measure (anxiety, anger, and depression) was modeled separately, with all Level 1 coefficients specified as random.

As hypothesized, wives' anxiety was associated with greater husbands' distress on the same day, Anxiety:  $b_3 = 0.11, t(32) = 3.04, p < .01$ ; Anger/Hostility:  $b_3 = 0.14, t(32) = 2.84, p < .01$ ; Depression:  $b_3 = 0.15, t(32) = 3.95, p < .01$ . There were no significant variations around the effects of wives' anxiety on husbands' distress (Anxiety:  $\tau = 0.01, LR \text{ test} = 0.60$ ; Anger/Hostility:  $\tau = 0.02, LR \text{ test} = 0.20$ ; Depression:  $\tau = 0.01, LR \text{ test} = 0.30$ ). The *LR* test here represents the difference between the  $-2 \log$  likelihood of a model that treats the effect of a particular coping strategy as random and a model that does not.

**Hypothesis 5. The Association Between Wives' Anxiety and Husbands' Distress Is Moderated by (a) Husband-Reported Hostility (PRS Scores) and (b) Husband-Reported Accommodation of the Wives' Symptoms (FAQ–M Scores)**

We tested the moderation hypothesis in three separate multilevel analyses. The same Level 1 equation described in Equation 4 was used for each analysis. Level 2 equations modeled the intercept as a function of two moderators (PRS and FAQ–M) resulting in additional predictors in each of the equations. Furthermore,  $b_3$  from Equation 4 was modeled as a function of the moderators as follows:

$$b_3 = \gamma_{30} + \gamma_{31}(PRS_{hi}) + \gamma_{32}(FAQ-M_{hi}) + \gamma_{33}(DAS_{wi}) + u_{0i} \tag{5}$$

$PRS_{hi}$  reflects husband-reported hostility for dyad  $i$ , and  $FAQ-M_{hi}$  reflects husband-reported accommodation. Wives' report of DAS was included as a covariate, with all Level 1 coefficients specified as random.

FAQ–M moderated the effect of wives' anxiety on husbands' anger/hostility,  $\gamma_{32} = 0.015, t(32) = 2.64, p < .05$ . As can be seen in Figure 2, for husbands who reported greater accommodation of the wives' anxiety symptoms, wives' anxiety was more likely to be associated with husbands' anger, than for those husbands who

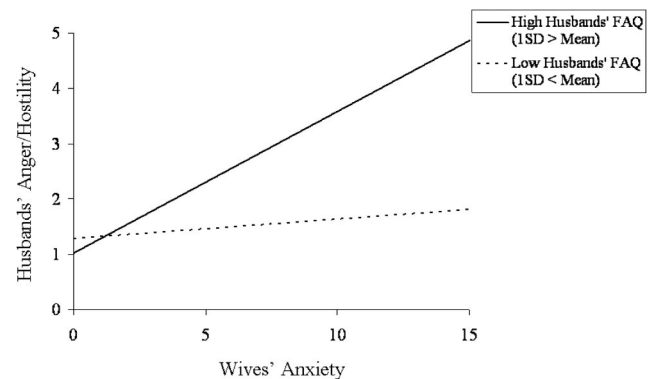


Figure 2. Prediction of husbands' anger with wives' anxiety as a function of high and low Family Accommodation Questionnaire—Modified (FAQ–M) scores.

reported low accommodation. FAQ-M did not moderate any other hypothesized within-dyad associations, Anxiety:  $\gamma_{32} = 0.004$ ,  $t(32) = 0.75$ , *ns*; Depression:  $\gamma_{32} = 0.004$ ,  $t(32) = 0.85$ , *ns*. Contrary to our hypothesis, PRS did not moderate the association between wives' anxiety and husbands' distress, Anxiety:  $\gamma_{32} = -0.001$ ,  $t(32) = -0.08$ , *ns*; Anger/Hostility:  $\gamma_{32} = -0.027$ ,  $t(32) = -1.54$ , *ns*; Depression:  $\gamma_{32} = -0.015$ ,  $t(32) = -0.94$ , *ns*. Furthermore, DAS scores did not moderate association between wives' anxiety and husbands' distress, Anxiety:  $\gamma_{33} = 0.004$ ,  $t(32) = 0.60$ , *ns*; Anger/Hostility:  $\gamma_{33} = -0.007$ ,  $t(32) = -0.95$ , *ns*; Depression:  $\gamma_{33} = -0.001$ ,  $t(32) = -0.16$ , *ns*.

## Discussion

Consistent with prior research, this study found an association between anxiety disorders and relationship distress (e.g., McLeod, 1994). This association was manifested as a process that occurs on a daily basis, not just at the level of global group differences. Responses on daily reports further indicated that wives perceived their partners to play some role in causing, aggravating, or ameliorating their anxiety.

Our findings suggest a cross-partner effect, such that on days when wives experienced increased anxiety, their husbands were more likely to report a reduction in positive qualities of the relationship. The fact that wives' anxiety was associated with husbands' positive but not negative RQ highlights the importance of distinguishing these two dimensions of relationship quality. McLeod (1994) similarly found that the presence of an anxiety disorder in one spouse was differentially related to positive and negative RQ ratings made by the same or other spouse. The positive RQ items rated in this study reflected the presence of support behaviors (e.g., "my partner was dependable," "my partner showed concern"), whereas the negative RQ items reflected the presence of conflict or discord (e.g., "my partner was critical"). Our results suggest that when wives experience elevated anxiety, husbands do not perceive increased relationship discord per se but instead experience diminished support and availability from the anxious spouse. The finding that anxiety was linked with *positive* relationship quality is of particular interest, in light of research by Gottman and his colleagues, showing that positive displays in couples' interactions (e.g., use of humor and affection) are highly predictive of the stability and future health of the relationship (Driver & Gottman, 2004; Gottman, Coan, Swanson, & Carrere, 1998). These authors have argued that having a reservoir of positive relationship experiences can be critical in offsetting the erosive effects of stress or conflict in the relationship.

Although 70% of couples reported overall satisfying relationships, the daily processes sampled showed evidence of fluctuating relationship quality in association with wives' anxiety. Furthermore, these processes did not appear to be impacted by DAS scores. Previous studies examining predictors of change in marital functioning have suggested that omnibus measures of marital functioning are largely uninformative in discriminating between relationships that stay intact and those that deteriorate over time (Gottman & Krokoff, 1989; Karney & Bradbury, 1997). Instead, specific aspects of couples' interactions, such as problem solving, and—of relevance here—the valence of affect surrounding interactions, have proven more predictive of marital trajectories (Johnson et al., 2005). Findings by Papp, Goeke-Morey, and Cummings

(2007) similarly attest to the unique impact of individual distress on specific aspects of the relationship over and above global sentiment about the relationship. Although the associations observed in this study were not influenced by global relationship adjustment, it is conceivable that the daily processes described could, in accumulation, shape the trajectory of global adjustment over time (Gottman & Krokoff, 1989).

Our finding that CIQ scores moderated the association between positive relationship quality and wives' daily anxiety is also consistent with the observations of Daiuto et al. (1998) and Marcella et al. (2003), who noted that anxiety-specific marital questionnaires may reveal linkages between anxiety and relationship quality that do not consistently emerge using broad-based marital functioning measures. Couples may competently manage various domains of their relationship (as is evidenced by high global adjustment scores), yet struggle to varying degrees in the management of one partner's anxiety. Chambless et al. (2001) similarly found that problem-solving difficulties in couples were especially pronounced when the topic of discussion was the wife's anxiety disorder. A high degree of communication and support in handling one partner's anxiety may be protective for couples affected by anxiety disorders, making it less likely that the partner's anxiety will impact relationship quality day to day.

On the majority of high anxiety days, wives rated their husbands as contributing to their anxiety in some capacity. Husbands were most frequently rated as alleviating anxiety, although on a substantial minority of occasions (17%), they were perceived as making the anxiety worse. This is not unexpected given that the sample was largely in the nondistressed range of marital functioning. Nevertheless, the fact that wives often perceived their husbands as appeasing their anxiety highlights the need to consider the marital relationship as a key resource in the treatment of anxiety disorders. Exploratory analyses further indicated that the proportion of high-anxiety days on which husbands were perceived as making the anxiety better was significantly correlated with the wives' own DAS scores ( $r = .38$ ,  $p < .05$ ).

As hypothesized, the degree of daily distress reported by husbands was significantly associated with wives' anxiety that same day. Data on the frequency of intradyad concordance in anxiety are strikingly sparse compared with what is known about contagion effects in depression (Joiner & Katz, 1999). Our findings suggest that elevated anxiety, like dysphoric mood, may induce negative affect among significant others. Given that feelings of anxiety are often accompanied by other mood states, further investigation is needed to clarify the specificity of anxiety transmission.

The significant mood concordance observed in this study reflects a dyad-level characteristic, rather than a mood induction process per se (e.g., convergence over time or a mate selection process). Although we did not collect data on psychopathology in husbands, the fact that they scored within normal ranges on measures of anxiety, depression and general psychological distress suggests that they did not share their wives' dispositions toward anxiety and/or negative affect.

Instead, the degree of shared distress within couples appeared to be moderated by the husbands' behavioral response to their wives' anxiety. The correspondence between wives' anxiety and husbands' anger was strengthened for partners who endorsed frequent accommodation of anxiety symptoms. Given the multiple comparisons conducted in this analysis, this finding may reflect a Type I

error and should be replicated in future studies. Nevertheless, prior research has shown that spousal concordance in coping styles, particularly avoidance coping, predicted concordance in depressive symptoms over time (Holahan et al., 2007). It is possible that when couples collude in managing anxiety through avoidance, they may inadvertently maintain or exacerbate the degree of shared distress from day to day.

### Limitations

The current study was limited by the use of a small and diagnostically heterogeneous sample. The processes observed may be more or less relevant to different diagnostic subgroups. For example, partner accommodation has different implications for a person suffering from OCD than for someone with GAD. Although we cannot assume that the observed processes apply similarly across different types of anxiety disorders, our findings suggest that the common propensity of adults with anxiety disorders to experience elevated anxiety in their daily life has immediate implications regarding the quality of their intimate relationships and the well-being of their significant others.

Although our findings suggest the importance of examining daily processes, our analyses were based on same-day associations and therefore do not tell us about the temporal direction of these associations. In exploratory analyses, we found no evidence of cross-day effects of anxiety on relationship quality or vice versa. However, the detection of lagged effects will depend on how long it takes for these processes to unfold. We can only conclude from this study that daily anxiety and relationship quality are concurrently associated and that this association is evident on a day-to-day basis.

A further limitation is that we limited our inquiry to three forms of negative affect, thus excluding other dimensions of affective experience such as guilt, shame, or positive affect. A growing body of research has pointed to the importance of positive interactions (e.g., use of humor, affection) in predicting changes in marital satisfaction (Bradbury & Karney, 2004; Gottman et al., 1998). Furthermore, low positive affect has been associated with both depression and social anxiety disorder (Brown, Chorpita, & Barlow, 1998). An important next step would be to broaden this investigation to include other affective experiences and to examine whether the degree of positive affect reported from day to day bears on relationship quality, independent of anxiety.

A related concern is that we did not have sufficient power to examine the emotional specificity of the observed associations in anxiety disorders. As almost one third of wives carried a secondary diagnosis of dysthymic disorder, it is likely that depressed mood played a role in the observed processes. There is evidence that the presence of concurrent anxiety and depression is associated with greater social impairment than either disorder alone (Hecht, von Zerssen, & Wittchen, 1990). It would be interesting to clarify whether concurrent depressed mood has an additive effect or contributes uniquely to daily relationship quality. Finally, because we used pencil-and-paper diary questionnaires, we relied on participants' own reports of compliance with the timing of diary completion, which may have been subject to social desirability effects.

The association between marital distress and anxiety disorders has not been documented as consistently as it has been for depres-

sive disorders (Whisman, 1999). In the current study, the mean DAS score reported by diagnosed adults (107) was considerably higher than that reported by Whisman (2001) for a sample of depressed adults (94), suggesting better relationship functioning. Although a direct comparison is needed to establish whether adults with anxiety disorders are more maritally satisfied than adults with depression, there is evidence that these diagnostic groups feature distinct interpersonal patterns (Grant, Beck, Farrow, & Davila, 2007). For example evidence suggests that adults with depressive symptoms feature a tendency to *underrely* on close others and reject help, whereas socially anxious adults feature a tendency to *overrely* on close others and avoid conflict and the expression of strong emotions (Darcy et al., 2005; Davila & Beck, 2002). It is conceivable that the safety-driven interpersonal behaviors exhibited by anxious adults are ultimately more protective of relationship functioning, although recent evidence suggests that anxious adults with these interpersonal styles may be at risk for the eventual emergence of depressive symptoms (Grant et al., 2007).

Further investigation into these processes may ultimately have important treatment implications. Although treatments for anxiety disorders have benefited from enlisting the participation of a significant other, the role of the partner has typically been that of cotherapist (Craske & Zoellner, 1995). The relational system itself is not commonly targeted, although there is evidence that the way in which couples organize their interaction patterns in the setting of one partner's anxiety may have implications for the outcome of individually focused anxiety disorder treatments (Baucom, Shoham, Mueser, Daiuto, & Stickle, 1998; Craske & Zoellner, 1995; Daiuto et al., 1998). Zinbarg, Lee, and Yoon (2007) recently showed that a significant portion of the variance (41%) in end-state functioning following a course of individual cognitive-behavioral therapy for GAD could be explained by the level of hostility and criticism evident during interactions between patients and their partners prior to treatment.

Anxiety disorders are chronic, unremitting, and associated with considerable impairment even beyond the remission of symptoms (Mendlowicz & Stein, 2002; Rodriguez, Bruce, Pagano, & Keller, 2005). Those in long-term, intimate relationships with adults suffering from anxiety disorders face the prospect of managing the affective and behavioral consequences with little substantial relief. The difference between couples who maintain positive sentiment regarding their relationships and those who do not may lie in the particulars of how anxiety is metabolized from day to day. Further advances in the technology of experience-sampling designs promise to usher in an era of investigation that will advance the study of intimate relationships in this population.

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