



Emotional Transmission in Couples Under Stress

Anne Thompson; Niall Bolger

Journal of Marriage and the Family, Vol. 61, No. 1. (Feb., 1999), pp. 38-48.

Stable URL:

<http://links.jstor.org/sici?sici=0022-2445%28199902%2961%3A1%3C38%3AETICUS%3E2.0.CO%3B2-8>

Journal of Marriage and the Family is currently published by National Council on Family Relations.

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/about/terms.html>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/journals/NCFR.html>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is an independent not-for-profit organization dedicated to and preserving a digital archive of scholarly journals. For more information regarding JSTOR, please contact support@jstor.org.

Emotional Transmission in Couples Under Stress

We examined emotional transmission in 68 couples in which one member was preparing to face a major stressful event, the New York State Bar Examination. This event is the final hurdle in the course of legal training, and it typically evokes high levels of distress in examinees. Examinees and partners provided daily diary reports of their activities and emotional states for 35 days surrounding the event. Concurrent and prospective analyses indicated that examinees' depressed mood on a given day was related to partners feeling less positive and more negative about the relationship. However, as the examination approached, this association declined to a negligible level. These results suggest that partners increasingly made allowances for examinees' negative affect. In this way, partners preserved their ability to be supportive when examinees needed the support most.

A defining feature of a close relationship is that one partner's psychological states and actions have the capacity to influence those of the other partner (Rusbult & Van Lange, 1996). An important type of influence is emotional transmission, when, for example, one partner's state of emotional distress can increase distress or reduce positive affect in the other partner (Hatfield, Cacioppo, & Rapson,

1994). Evidence from a number of studies shows that emotional transmission is a common occurrence in close relationships in everyday life (Larson & Almeida, 1999; Larson & Richards, 1994).

If emotions are transmitted in everyday situations, then it is plausible that this process is accentuated in times of stress when negative emotions are particularly heightened. Hatfield et al. (1994), for example, argue that the more intense a person's emotions, the more likely they are to affect the emotions of another person. Consider the situation of a married couple living with an ill child who must undergo repeated hospitalizations over the course of a year. As this experience becomes prolonged, the parents may become more and more distressed and worn out, and they may be increasingly unable to prevent their negative emotions from affecting one another (Lane & Hobfoll, 1992). Or consider the case of a married couple in which the wife's breast cancer causes her to be highly distressed, a situation that, in turn, erodes her relationship with her spouse (Bolger, Foster, Vinokur, & Ng, 1996). Such situations plausibly involve an increase in emotional transmission between spouses.

On the other hand, it may be that in times of stress couples make special efforts to reduce the transmission of negative emotions. For example, in studies of patients and their spouses, Coyne and his colleagues identified a process they call relationship-focused coping. To protect the relationship, each partner attempts to avoid behaving in ways that might burden the other (Coyne, Ellard, & Smith, 1990; Coyne & Smith, 1991). Another possible reason why transmission might decrease under stress is that one spouse may attribute the

Department of Psychology, New York University, 6 Washington Place, 4th Floor, New York, NY 10003.

Key Words: anxiety, close relationships, depression, emotional contagion, relationship satisfaction, stress.

distress of the other to the stressful situation and not react to it as strongly as he or she would in more ordinary circumstances (Revenson & Majerowitz, 1990). This process of making allowances for the spouse's distress can be seen as the opposite of the process described by Bradbury and Fincham (1993) in which spouses in distressed couples make distress-enhancing attributions for one another's behavior.

Given that stressful situations might either accentuate or diminish emotional transmission, it is of interest to determine which scenario is accurate. To date, no studies have addressed the question of how transmission changes when couples experience a stressful event. Will emotional transmission increase as a stressful event unfolds, or is a coping process set in motion in which partners become less reactive to one another's distress?

To examine this question, we selected couples in which one member was soon to experience a major stressful event, the New York State Bar Examination. The bar examination is the final hurdle in the course of legal training, and it typically evokes high levels of distress in examinees. It can be expected to put the examinee and the partner under much strain, disrupt their daily routines and, according to the negative scenario above, lead to increases in the transmission of emotions. We used an intensive prospective design, in which we obtained daily reports of activities and emotional states from both members of the participating couples in the weeks leading up to and including the event.

Our design had several additional features that helped us to study this process in close relationships under stress. First, because the bar exam was a scheduled event, we were able to examine emotional transmission prospectively in the weeks leading up to and beyond the exam. We could follow couples from a time of relatively low stress, when the approaching examination might not have greatly affected daily routines, to a time of high stress, when daily routines were likely to be disrupted, and finally to a time of low stress, when the examination was finished.

Second, we could look at a situation in which one member of a couple was directly affected by the approaching stressor. This simplifies studying transmission because there is an obvious sender and receiver. We focused on how two negative emotions, the examinee's anxiety and depression, affected the partner's positive and negative feelings about the relationship. We focused on the examinee's anxiety and depression because these were

the most likely negative emotions to be aroused by the examination. We focused on the partner's positive and negative feelings about the relationship because, we reasoned, these were the emotions that would be most directly affected by the examinee. We also thought they were likely to be mediators of more pervasive effects such as decreases in the partner's overall relationship satisfaction.

METHOD

Design and Sample

To recruit respondents, we asked 15 New York State law schools to distribute letters to their graduating students. Nine law schools agreed to do so. Each letter described the study, specified eligibility criteria, and indicated that a fee of \$50 would be paid to couples who completed all materials. Law students were eligible if they were in a romantic relationship with a partner of the opposite sex and if they expected to be living with their partner at the time of the study. Couples were excluded from participation if both members were taking the test. A postcard was included in the mailing for the respondent to return if he or she were interested in participating in the study.

Recruitment letters were sent to all final-year law students because information about the relationship status of graduating law students was unavailable. We sent a total of 2,700 letters, and 140 postcards were returned. Students who returned postcards were contacted by phone and given more details about the study. Ninety-nine couples agreed to participate.

Two months before the examination, we sent couples a questionnaire that assessed a variety of demographic, personality, and social background variables. Included in this mailing was an initial payment of \$20. One month before the examination, we sent couples two booklets of seven daily diaries, one for the examinee and one for the partner. The diary was designed to be completed in less than 5 minutes. Participants were instructed to complete their diaries separately each day at bedtime, and they were explicitly instructed not to discuss their daily responses. After completing an entire week of diaries, participants were to return them in a prestamped envelope. This procedure continued for the entire 5 weeks of the diary period. After completing the last week of diaries, couples received a final payment of \$30.

A final sample of 68 couples completed all the materials (69% of the 99 couples who initially

agreed to participate). It is difficult to assess the true response rate that these numbers represent because data on the number of eligible law students were not collected by law schools. Informal discussions with officials at law schools, however, combined with national data on cohabitation in this age group from the National Survey of Families and Households (Bumpass & Sweet, 1995) suggest that approximately 15% of students were eligible. Assuming this is the case, the effective response rate was $68/(2700 \times .15) = 17\%$.

Sixty-six percent of the examinees in this final sample were male. The mean age of examinees was 29.4 years ($SD = 5.1$), and the mean age of partners was 29.5 ($SD = 5.9$). Couples had been living together for an average of 3.3 years ($SD = 3.8$). Two thirds of the couples were married. Eighty-one percent of partners had at least a bachelor's degree.

Measures

Examinee distress. The examinee's daily anxiety and depressed mood were measured with items from the Profile of Mood States (Lorr & McNair, 1971). We used the four highest loading items from a factor analysis conducted by Lorr and McNair to measure each affect. The items that measured anxiety were "on edge," "uneasy," "anxious," and "nervous." The items that measured depression were "hopeless," "worthless," "sad," and "discouraged." Each examinee was asked to rate the extent to which he or she had experienced these feelings in the past 24 hours. Ratings were on a 5-point scale, ranging from *not at all* (1) to *extremely* (5). Before analyses were conducted, we rescaled these item scores to the 0-to-4 interval. We calculated daily scores for examinees' anxiety and depression by averaging the relevant items. Based on within-subject variability, Cronbach's alphas for examinee anxiety and examinee depression were .86 and .78, respectively.

Partner's feelings about the relationship. We measured the partner's daily feelings about the relationship with a modification of a measure used by Simpson (1987). For each item (e.g., excited, sad, calm, fearful, surprised), respondents rated the extent to which they had experienced that particular emotion within their relationship in the past 24 hours on a 5-point scale, ranging from *not at all* (1) to *extremely* (5). Again, before analyses were conducted, we rescaled these item scores to the 0-to-4 interval.

The bar examination as a stressor. The New York State Bar Examination involves two days of assessment and includes essay questions about state law and multiple-choice questions about national law. All prospective lawyers must pass the examination to practice law in New York State. Students typically take the examination in July of the year they complete law school. The pass rate overall and for first-time takers is 75% and 80%, respectively.

Most individuals consider this event to be highly stressful. Students typically spend the months of May through July of their final year in law school preparing for the exam. They often enroll in intensive review courses during this period. Failing the exam can result in considerable embarrassment because law graduates typically will have positions in a law firm by the time the results of the examination are released. When asked (several months after the event) to rate on a 100-point scale the stressfulness of hurdles encountered in law school, participants rated the bar examination as the most stressful by far.

RESULTS

Overview

We began by investigating the factor structure of the outcomes of emotional transmission used in the study, the partner's daily positive and negative feelings about the relationship. Then we examined how the presumed inputs to the transmission process—the examinee's daily anxiety and depression—changed during the 35 days surrounding the examination. Finally, in concurrent (same-day) and prospective (cross-day) analyses, we investigated how the examinee's daily anxiety and depression were linked to the partner's feelings about the relationship and how these links changed over the 35 days. Although the process of emotional transmission is likely to vary across couples (e.g., as a function of relationship quality), our focus was on identifying transmission processes in the average couple.

Partner's Daily Feelings About the Relationship: Confirmatory Factor Analysis

To construct measures of positive and negative feelings about the relationship, we selected items from the partner's diary that tapped relationship contentment, exhilaration, anxiety, and depression, and we conducted a confirmatory factor analysis to examine their psychometric adequacy.

The items hypothesized to tap the partner's relationship emotions were "satisfied," "happy," and "content" for relationship contentment, "excited" and "passionate" for relationship exhilaration, "fearful" and "worried" for relationship anxiety, and "sad" and "depressed" for relationship depression. We hypothesized that each item would load only on its respective factor and that the factors would be correlated. The data matrix consisted of each partner's daily scores on each item, with the partner's mean score across all diary days subtracted. We subtracted each partner's mean score from their item scores because we were interested in assessing the factor structure of a matrix that consisted of only within-partner variation. Of a possible 2,380 person-days (68 × 35), 2,324 were available for analysis.

Maximum likelihood estimates of the factor model were obtained using LISREL 7 software (Jöreskog & Sörbom, 1988). Given the large number of observations, the overall chi-square for the model was large relative to its degrees of freedom, $\chi^2(21, n = 2324) = 175.74, p < .0004$. However, the goodness-of-fit and adjusted goodness-of-fit indices were .98 and .97, respectively, indicating that the model fit the data well.

Figure 1 displays the parameter estimates. All estimates are significant at $p < .05$. Correlations between the two positive and the two negative emotions are in the .7 range. In contrast, correlations between each positive and negative emotion were noticeably lower, in the $-.2$ to $-.5$ range. Thus, over the diary period, a partner's daily feelings of relationship anxiety often were linked to

his or her feelings of relationship depression but not necessarily to feelings of relationship contentment or exhilaration.

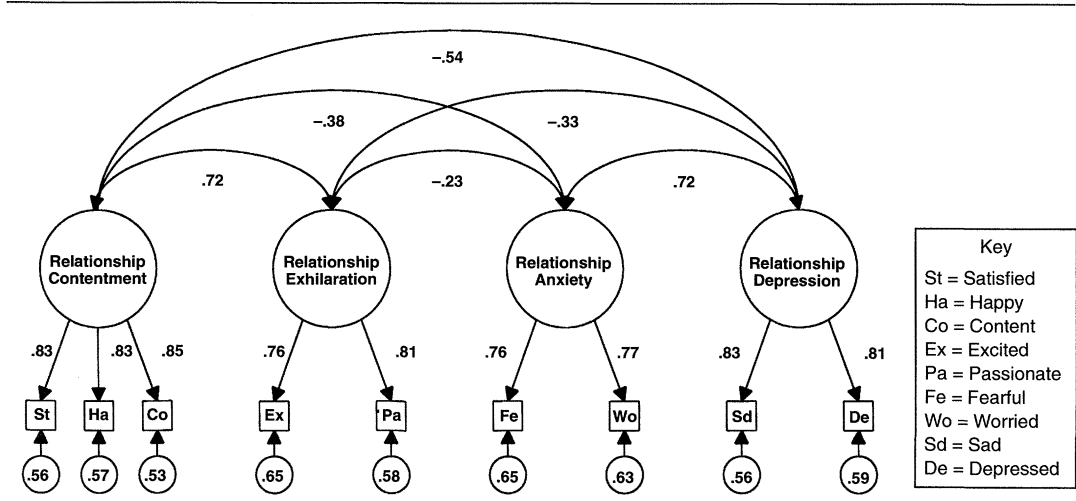
Based on the results of the confirmatory factor analysis, we constructed scales representing the four partner emotions in the relationship. We obtained scale scores by taking the mean of the relevant items. Based on within-partner variation, Cronbach's alphas for the partner feelings about the relationship were .87 for relationship contentment, .76 for relationship exhilaration, .73 for relationship anxiety, and .80 for relationship depression.

Changes in Examinee Distress

Recall that the diary design involved 35 daily reports from the examinee and the partner, and reports were obtained at the end of each day. The first 31 reports (Days 0–30) were obtained on days prior to and including the examination. The final four reports were obtained after the examination (Days 31–34). Preliminary inspection of examinees' data indicated that their distress increased more or less linearly over the pre-examination period, declined abruptly when the examination ended, and then remained low. To model this pattern of change in examinee distress, we estimated a multilevel model, one that allowed each examinee to have his or her own equation.

The model had two levels, a within-couple level and a between-couple level. For the within-couple level, each examinee in a couple had his or her own equation that specified (a) a linear increase in distress each day as the study progressed

FIGURE 1. CONFIRMATORY FACTOR ANALYSIS MODEL OF WITHIN-COUPLE VARIATION IN DAILY PARTNER FEELINGS ABOUT RELATIONSHIP



and the examination approached, (b) an abrupt change in distress when the examination finished, and (c) a constant level after the examination finished. The within-couple equation was as follows:

$$D_{it} = c_{0i} + c_{1i}T_t + c_{2i}F_t + e_{it} \quad (1)$$

D_{it} is the examinee's distress on a given day t , for couple i . T_t is a variable indexing the passage of time and is coded 0 for Day 0 (the first day), 1 for Day 1, and so on, up to 30 for the day when the examination began. It is coded 31 for Days 31–34, which implies a constant effect of time after the examination. (Note that the examination ended on Day 31, before the diary report for that day was obtained.) F_t is a dichotomous variable that has the value 0 for all diary days before Day 31 and has the value 1 for Days 31–34. With T_t and F_t coded this way, the intercept, c_{0i} , captures the predicted level of distress at the end of the first day of the diary period (Day 0) for the examinee in couple i . The coefficient for T_t , c_{1i} , estimates the linear change in examinee distress each day as the examination approaches for couple i . The coefficient for F_t , c_{2i} , estimates the instantaneous shift in examinee distress when the examination finishes on Day 31 for couple i .

We also tested whether the increase in examinee distress over the pre-examination period showed evidence of nonlinearity, and where necessary we included nonlinear terms in the equation to reflect this.

Whereas the within-couple equations show the results for each couple's examinee, the between-couple equations show the results for the average couple's examinee. In fact, the between-couple equations specify the average of the within-couple coefficients, as follows:

$$c_{0i} = a_0 + e_{0i} \quad (2)$$

$$c_{1i} = a_1 + e_{1i} \quad (3)$$

$$c_{2i} = a_2 + e_{2i} \quad (4)$$

Thus, a_0 signifies the predicted level of distress at the beginning of the diary period for the examinee in the average couple. The term e_{0i} signifies the examinee in couple i 's deviation from that average. Similarly, a_1 is the linear change in distress as the examination approaches for the examinee in the average couple, and e_{1i} is the examinee in couple i 's deviation from that average. Finally, a_2 captures the instantaneous shift in distress when the examination ends for the examinee in the average couple, and e_{2i} is the examinee in couple i 's deviation from that average. The coefficients for

TABLE 1. CHANGES IN EXAMINEE'S DAILY ANXIETY AND DEPRESSION: MULTILEVEL MODEL RESULTS FOR THE AVERAGE EXAMINEE

	Examinee Anxiety	Examinee Depression
Initial level	1.01*	0.45*
Linear change per day	0.0360*	0.0064*
Level at examination	2.13*	0.65*
Change after examination	-1.09*	-0.31*
R^2	.31	.22

* $p < .05$.

the multilevel model were estimated using a weighted least squares approach that can be implemented in the SAS PROC GLM program (SAS Institute, 1990). The approach is described in Kenny, Kashy, and Bolger (1998).

To summarize, our multilevel model estimated the initial level of examinee distress, the linear change in distress as the examination approached, and the instantaneous change in distress after the examination ended, for the average examinee. Table 1 shows the relevant estimates for examinee anxiety and depression. Note that once the initial level and linear change in distress are known, the level of distress on any subsequent day can be estimated. For completeness, therefore, we also include in Table 1 an estimate of the level of distress at the point immediately before the instantaneous shift in distress at the end of the examination.

Both examinee anxiety and depression show a linear increase as the examination approaches and a substantial instantaneous decline after the examination ends. (See Table 1.) The effects are much more pronounced for anxiety than for depression. In multilevel models such as these where a separate regression equation is estimated for each examinee, the goodness-of-fit of the model will vary from examinee to examinee. To provide some indication of goodness-of-fit, however, we report in Table 1 R^2 values for anxiety and depression for the average examinee.

Given that it is now conventional to estimate multilevel models using maximum likelihood approaches rather than the weighted least squares approach used here, for all models reported in this article we also obtained maximum likelihood estimates using PROC MIXED in SAS (SAS Institute, 1997). In all cases, these were similar to the comparable weighted least squares estimates. Kenny, Kashy, and Bolger (1998) discuss the differences between weighted least squares and maximum likelihood approaches to multilevel model estimation.

*Transmission of Examinee Distress to Partner
Feelings About the Relationship*

Concurrent analyses. Given that examinee anxiety and depression increased as the examination approached, we assessed the extent to which these emotions were associated with the partner's feelings about the relationship. To do so, we estimated another multilevel model that specified a transmission effect of examinee distress on partner feelings about the relationship. The model allowed us to determine whether transmission increased or decreased as the examination approached. The model also allowed us to see if, like examinee distress itself, transmission changed abruptly after the examination was finished. The model examines same-day associations only. Later we will investigate cross-day associations. The within-couple model is as follows:

$$P_{it} = g_{0i} + g_{1i}T_t + g_{2i}F_t + g_{3i}D_{it} + g_{4i}D_{it}T_t + g_{5i}D_{it}F_t + e_{it} \quad (5)$$

P_{it} is the partner's feelings about the relationship on day t for couple i . As before, T_t indexes time, and F_t indexes the finish of the examination. D_{it} is the examinee's distress on day t for couple i , and $D_{it}T_t$ and $D_{it}F_t$ are product variables of D_{it} with T_t and F_t , respectively. With the independent variables defined in this way, g_{3i} estimates the transmission of distress to the partner's feelings about the relationship at the beginning of the diary period (Day 0). The coefficient g_{4i} captures the rate of change per day in the transmission effect. The coefficient g_{5i} captures the instantaneous shift in the transmission effect as the examination finishes (on Day 31).

The between-couple equations were specified in the same way as they were in our multilevel models of changes in examinee distress. The between-couple equations involved estimating values of the within-couple coefficients for the average couple.

Thus b_0 through b_5 are estimates of g_0 through g_5 for the average couple.

We found no evidence of transmission effects of the examinee's anxiety on the partner's feelings about the relationship, and thus we will not present estimates for anxiety. In contrast, examinee depression showed substantial transmission effects. Table 2 shows the relevant parameter estimates for the two positive partner emotions, relationship contentment and exhilaration, and the two negative partner emotions, relationship anxiety and depression. Figure 2 provides a graphic representation of the results. (To simplify Table 2, we omit the estimates for b_0 , b_1 , b_2 .) For completeness, we include in Table 2 an estimate of the transmission effect immediately before the instantaneous shift at the end of the examination. Although this is not a parameter in Equation 5, once the parameters in Equation 5 are estimated, its value can be calculated.

In the case of partner relationship contentment, the relevant results are in column 1 of Table 2 and panel 1 of Figure 2. On Day 0, the transmission effect was $-.44$, indicating that, for the average couple, depressed mood of the examinee was associated with lower relationship contentment of the partner. Given that examinee distress and partner feelings about the relationship are both expressed in the same units (scales from 0 to 4), this is a substantial rate of transmission. As the day of the examination approached, the rate changed linearly by $.012$ units per day. This resulted in a low and nonsignificant rate of transmission of $-.07$ immediately before the examination ended (a cumulative change of $.37$ units). At the end of Day 31, when the examination was over, the rate showed an instantaneous nonsignificant change of $-.10$ units.

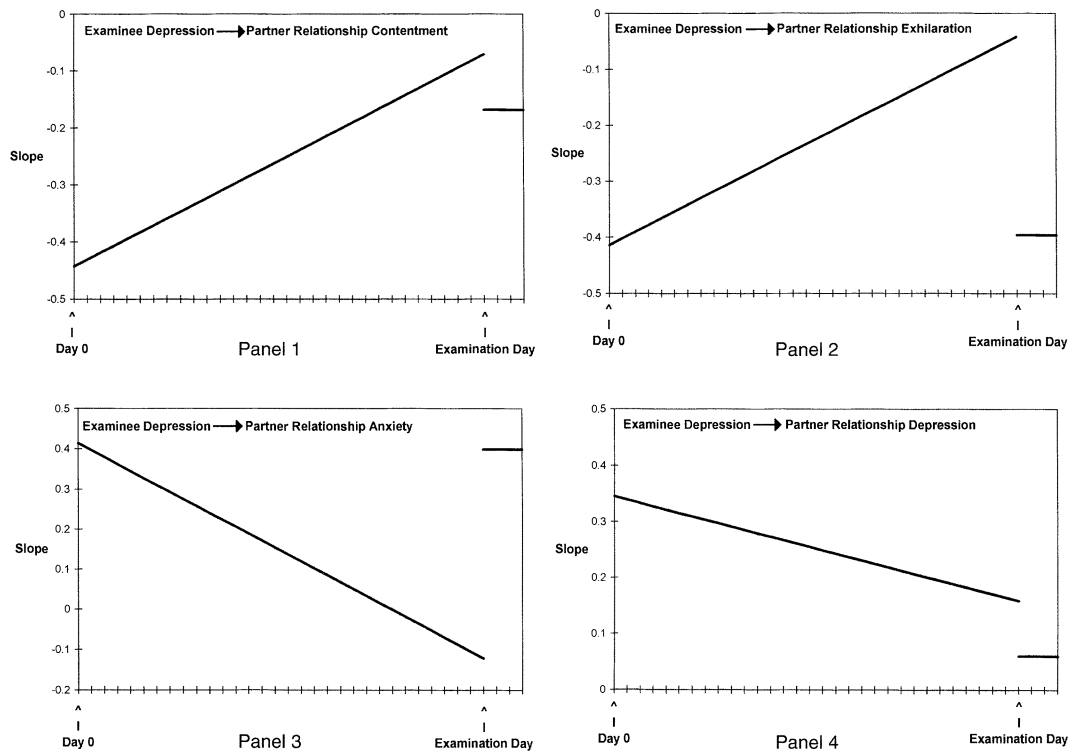
The results for exhilaration are presented in column 2 of Table 2 and panel 2 of Figure 2. These results are similar to those for contentment. The initial level of transmission was substantial,

TABLE 2. SAME-DAY SLOPES RELATING EXAMINEE'S DAILY DEPRESSION TO PARTNER'S DAILY RELATIONSHIP CONTENTMENT, EXHILARATION, ANXIETY, AND DEPRESSION: MULTILEVEL MODEL RESULTS FOR AVERAGE COUPLE

Predictor:	Today's Partner Relationship Contentment	Today's Partner Relationship Exhilaration	Today's Partner Relationship Anxiety	Today's Partner Relationship Depression
Initial slope	-0.44*	-0.41*	0.41*	0.35*
Linear change in slope per day	0.012*	0.012*	-0.017*	-0.006
Slope at examination	-0.07	-0.04	-0.12	0.17*
Change in slope after examination	-0.10	-0.35*	0.52*	-0.09
R^2	.31	.20	.29	.20

* $p < .05$.

FIGURE 2. SAME-DAY SLOPES RELATING EXAMINEE'S DAILY DEPRESSION TO PARTNER'S DAILY RELATIONSHIP CONTENTMENT, EXHILARATION, ANXIETY, AND DEPRESSION: MULTILEVEL MODEL RESULTS FOR AVERAGE COUPLE



and it declined as the examination approached. On Day 0 the transmission effect was $-.41$, indicating that examinee depression was associated with lower relationship exhilaration. The rate changed by $.012$ units per day, resulting in a transmission rate of $-.04$ at the examination (again, a cumulative change of $.37$ units). The results differ from those of contentment, however, in that the end of the examination was associated with a significant instantaneous increase in transmission. The final level of transmission ($-.39$) was approximately the same as it was on Day 0 of the diary period.

The transmission effects of examinee depression on the partner's relationship anxiety are displayed in column 3 of Table 2 and panel 3 of Figure 2. On Day 0 the transmission effect was $.41$, indicating that examinee depression was associated with an increase in partner anxiety in the relationship. As the examination approached, the rate declined linearly by $.017$ units per day. By Day 31, immediately before the examination ended, the estimated effect was $-.12$ (a cumulative decline of $.53$ units). There was a significant and substantial increase in transmission when the

examination ended. As in the case of partner's relationship exhilaration, the final level of transmission ($.40$) was approximately the same as it was on Day 0 of the diary period.

The results for partner depression in the relationship show that the rate of transmission was relatively unchanged during the study period. Table 2, column 4, and Figure 2, panel 4, show that the initial rate was $.35$ units and that this declined by a (nonsignificant) rate of $.006$ units per day, resulting in a rate at the examination of $.17$. The change in transmission associated with the end of the examination was small ($-.09$ units) and nonsignificant.

Prospective analyses. Thus far we presented concurrent associations between examinee depression and partner emotions in the relationship. Although it seems reasonable, given the context of the bar examination, that these associations reflect the effect of the examinee's depression on the partner, we cannot rule out the possibility that the partner's feelings about the relationship are affecting the examinee's depression. Prospective analyses of the association between today's examinee de-

TABLE 3. CROSS-DAY SLOPES RELATING EXAMINEE'S DAILY DEPRESSION TO PARTNER'S DAILY RELATIONSHIP CONTENTMENT, EXHILARATION, ANXIETY, AND DEPRESSION: MULTILEVEL MODEL RESULTS FOR AVERAGE COUPLE

Predictor: Today's Examinee Depression	Tomorrow's Partner Relationship Contentment	Tomorrow's Partner Relationship Exhilaration	Tomorrow's Partner Relationship Anxiety	Tomorrow's Partner Relationship Depression
Initial slope	-.05	-.27*	.14*	.16*
Linear change in slope per day	.0003	.0120*	-.0050*	-.0042*
Slope at examination	-.04	.10	-.02	.03
Change in slope after examination	.19	.08	-.01	-.22*
R ²	.31	.26	.30	.25

**p* < .05.

pression and tomorrow's partner emotions, controlling for today's partner emotions, are immune to this criticism. We present such analyses in this section.

We conducted two sets of analyses. In the first, we estimated within-couple models in which the dependent variables were tomorrow's partner feelings about the relationship. The independent variables were the same as in Equation 5 except that we included today's partner feelings about the relationship as a control variable. Thus the analysis examines to what extent today's examinee depression predicts residualized change in the partner's feelings about the relationship between today and tomorrow. In the second set of analyses, the roles of examinee depression and partner feelings about the relationship were reversed so that today's partner feelings were used to predict tomorrow's examinee depression.

Table 3 presents the results of the first set of analyses. There is considerable similarity between these results and the concurrent associations presented in Table 2. For three of the four partner-relationship emotions, examinee depression on Day 0 predicted residualized change in these emotions between Day 0 and Day 1. For the same

three partner emotions, there was a significant linear change in the depression slope, so that the estimate immediately before the end of the examination was small and nonsignificant. Unlike the results in Table 2, however, there was little evidence of a rebound in associations after the examination ended. This may be due to the smaller number of days after the examination (3 vs. 4) that could be used in this analysis. The exception was partner-relationship depression, in which surprisingly, the cross-lagged effect of examinee distress declined significantly after the examination.

The results of the second set of analyses, for the most part, confirmed our expectations. These results are presented in Table 4. All initial slopes for the association of partner-relationship emotions to residualized change in examinee depression were small and nonsignificant. For partner-relationship anxiety and depression, the coefficients for linear change and instantaneous change after the examination were negligible. However, for partner-relationship contentment and exhilaration, an interesting pattern emerged in which the nonsignificant initial relationship changed over time so that at the examination their coefficients were negative and significant. Thus, the partner's

TABLE 4. CROSS-DAY SLOPES RELATING PARTNER'S DAILY RELATIONSHIP CONTENTMENT, EXHILARATION, ANXIETY, AND DEPRESSION TO EXAMINEE'S DAILY DEPRESSION: MULTILEVEL MODEL RESULTS FOR AVERAGE COUPLE

	Effect of Today's Partner Relationship Contentment on Tomorrow's Examinee Depression	Effect of Today's Partner Relationship Exhilaration on Tomorrow's Examinee Depression	Effect of Today's Partner Relationship Anxiety on Tomorrow's Examinee Depression	Effect of Today's Partner Relationship Depression on Tomorrow's Examinee Depression
Initial slope	0.02	0.00	-0.04	0.02
Linear change in slope per day	-0.0029*	-0.0017	0.0027	0.0014
Slope at examination	-0.07*	-0.05*	0.05	0.06
Change in slope after examination	0.02	-0.06	-0.01	-0.06
R ²	.19	.30	.24	.33

**p* < .05.

positive feelings about the relationship predicted a decline in examinee depression at the time of highest stress.

Summary

We have just examined evidence of emotional transmission in couples in which one person underwent a major stressor. We used a within-couple analysis strategy to see the extent to which the examinee's anxiety and depression on a given day were related to the partner feeling worse about the relationship that day and the following day. At the beginning the diary period, approximately a month before the examination, we found evidence that the examinee's depressed mood was transmitted to the partner's feelings about the relationship, resulting in reduced feelings of contentment and exhilaration and increased feelings of anxiety and depression. Except in the case of relationship depression, these transmission effects changed linearly as the examination approached. Transmission was essentially zero on the examination days. Our analyses also revealed that during most of the diary period there was little evidence that the partner's feelings about the relationship predicted changes in the examinee's depression. However, immediately before the examination, the partner's positive feelings about the relationship predicted a decline in the examinee's depression.

DISCUSSION

In the introduction, we considered two possible scenarios of how emotional transmission in couples could be affected by a stressful event. In the negative scenario, the onset of a stressor decreases the ability of spouses to prevent their negative emotions from affecting the partner. In the positive scenario, the approach of a stressor instigates a dyadic coping process, so that the transmission of negative emotions decreases over time. We assessed the adequacy of these scenarios in a prospective study of couples in which one spouse was about to take the New York State Bar Examination.

Our results support the positive scenario. As the examination approached and examinees became increasingly anxious and depressed, their depression appeared to have an increasingly smaller effect on their partners' feelings about the relationship. This decrease in reactivity to the examinee's depressed mood may be due, in part, to a change in the attributions the partner makes for the examinee's distress (Bradbury & Fincham, 1993;

Kelley & Michela, 1980). Specifically, the partner may attribute the examinee's distress and associated behavior to the approaching examination, not to the examinee or the relationship. The decrease in reactivity also may reflect what Coyne et al. (1990) call protective buffering, in which, for example, the partner defers to the examinee in order to avoid exacerbating the examinee's already high levels of distress.

These results add to the literature of emotional transmission in everyday life (Larson & Almeida, 1999). They extend this literature by demonstrating how transmission can change over the course of a stressful experience. They also reinforce the idea that when the distress of one member of a couple is readily attributable to an environmental stressor, the partner will make special efforts to tolerate negative emotions that they would not ordinarily tolerate (Revenson & Majerowitz, 1990). This seems particularly likely when, as in the current study, the stressor is important, time limited, and in the service of a goal to which both members of a couple subscribe. However, distress containment also may occur in couples under chronic stress. For example, Downey, Purdie, and Schaffer-Neitz (1999) found evidence of distress containment in couples in which the wife had a chronic-pain condition.

There is, however, an alternative and less benign explanation for the decline in emotional transmission. Perhaps the aversiveness of the examinee's distress leads the partner to avoid the examinee and spend less time interacting with him or her. Although we cannot definitively rule out this possibility, it does not accord with results found by Bolger, Zuckerman, and Kessler (1998) using the same data set. They found that both examinees and partners reported that the partner provided increasing support to the examinee as the bar examination approached. Moreover, the partner's support became increasingly effective in preventing a rise in distress during the same period. This suggests that partners were especially attentive to the examinee's needs when stress was greatest.

There is further evidence against the idea that the partner withdrew from the examinee when the examination approached. In prospective analyses we found that the partner's positive feelings about the relationship predicted declines in the examinee's depression on days close to the examination. Thus, putting the results of the two studies together, we see that the partner appears to have played an engaged, supportive role at a time of high stress.

A reviewer raised the possibility that the decline in transmission over time might be due to a concurrent decline in the range of the constituent variables. To address this issue, we examined whether the standard deviations of examinee distress and partner feelings about the relationship changed appreciably as the examination approached. The observed standard deviations remained remarkably stable across the diary period and declined only in the final two days of the study (Days 33 and 34) and only for examinee distress. Thus, our pattern of results cannot be explained by a decline in the range of participants' scores on these variables.

The differential interpersonal effects of examinee anxiety and depression deserve comment. Given that examinee anxiety increased more than examinee depression, it was somewhat surprising that the examinee's high level of pre-examination anxiety was unrelated to the partner's feelings about the relationship. These results make sense, however, when one considers research on the interpersonal consequences of depression. Many studies document that depressed affect is readily transmitted to others (Howes, Hokanson, & Lowenstein, 1985; Joiner, Alfano, & Metalsky, 1992; Paddock & Nowicki, 1986; Strack & Coyne, 1983) and, more generally, has interpersonally disruptive effects (Burns, Sayers, & Moras, 1994; Coyne et al., 1987; Taylor, Underwood, Thomas, & Zhang, 1987).

One limitation of our study is that we obtained only one diary report per day. Given the stressfulness and time urgency of the bar examination, we felt we could not risk taking multiple measurements from examinees on the same day. However, emotional transmission is likely to be strongest on the day the emotions occur, and in our study we assessed this transmission using concurrent analyses. These analyses may be misleading, though, to the extent that the partner's feelings about the relationship on a given day affect the examinee's distress on that day. It is important in future research to examine the processes of within-day transmission using designs that involve multiple assessments per day.

Another limitation of the study is our focus on typical couples. Couples will probably differ in transmission processes as a function of the gender of the examinee, the quality of the relationship, and the duration of the relationship. Clearly, future investigations should focus on how emotional transmission varies as a function of a variety of individual and dyadic factors.

In summary, this study examined emotional transmission in couples in which one member faced an acute, time-limited, stressful event. Results indicated that the rate of emotional transmission, appreciable at the beginning of the diary period, decreased as the examination approached. Thus it appears that couples were able to temporarily halt the transmission of negative emotions between the examinee and partner, a process that probably helped partners be supportive when examinees needed it most.

REFERENCES

- Bolger, N., Foster, M., Vinokur, A. D., & Ng, R. (1996). Close relationships and adjustment to breast cancer. *Journal Personality and Social Psychology, 70*, 283-294.
- Bolger, N., Zuckerman, A., & Kessler, R. (1998). *Visible support, invisible support, and adjustment to stress*. Manuscript submitted for publication.
- Bradbury, T. N., & Fincham, F. D. (1993). Attributions in marriage: Review and critique. *Psychological Bulletin, 107*, 3-33.
- Burns, D. D., Sayers, S. L., & Moras, K. (1994). Intimate relationships and depression: Is there a causal connection? *Journal of Consulting and Clinical Psychology, 62*, 1033-1043.
- Bumpass, L. L., & Sweet, J. A. (1995). *Cohabitation, marriage and union stability: Preliminary findings from NSFH2* (Working Paper NSFH-65). Madison: University of Wisconsin, Center for Demography and Ecology.
- Coyne, J. C., Ellard, J. H., & Smith, D. A. (1990). Unsupportive relationships, interdependence, and unhelpful exchanges. In I. G. Sarason, B. R. Sarason, & G. Pierce (Eds.), *Social support: An interactional view*. New York: Wiley.
- Coyne, J. C., Kessler, R. C., Tal, M., Turnbull, J., Wortman, C. B., & Greden, J. F. (1987). Living with a depressed person. *Journal of Consulting and Clinical Psychology, 55*, 347-353.
- Coyne, J. D., & Smith, D. A. (1991). Couples coping with a myocardial infarction: A contextual perspective on wives' distress. *Journal of Personality and Social Psychology, 61*, 404-412.
- Downey, G., Purdie, V., & Schaffer-Neitz, R. (1999). Anger transmission from mother to child: A comparison of mothers in chronic pain and well mothers. *Journal of Marriage and the Family, 61*, 62-73.
- Hatfield, E., Cacioppo, J., & Rapson, R. (1994). *Emotional contagion*. New York: Cambridge University Press.
- Howes, M. J., Hokanson, J. E., & Lowenstein, D. A. (1985). Induction of depressive affect after prolonged exposure to a mildly depressed individual. *Journal of Personality and Social Psychology, 49*, 1110-1113.
- Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*, 165-173.
- Jöreskog, K. G., & Sörbom, D. (1989). *Lisrel 7: A guide to the program and applications*. Chicago: SPSS.

- Kenny, D. A., Kashy, D., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed.). New York: McGraw-Hill.
- Kelley, H. H., & Michela, J. L. (1980). Attribution theory and research. In M. R. Rosenzweig & L. W. Porter (Eds.), *Annual review of psychology* (Vol. 31, pp. 457-501). Palo Alto, CA: Annual Reviews.
- Lane, C., & Hobfoll, S. E. (1992). How loss affects anger and alienates potential supporters. *Journal of Consulting and Clinical Psychology, 60*, 935-942.
- Larson, R., & Almeida, D. M. (1999). Emotional transmission in the daily lives of families. *Journal of Marriage and the Family, 61*, 5-20.
- Larson, R., & Richards, M. H. (1994). *Divergent realities*. New York: Basic Books.
- Lorr, M., & McNair, D. M. (1971). *The Profile of Mood States manual*. San Diego, CA: Educational and Industrial Testing Service.
- Paddock, J. R., & Nowicki, S. (1986). Paralanguage and the interpersonal impact of dysphoria: It's not what you say but how you say it. *Social Behavior and Personality, 14*, 29-44.
- Revenson, T. A., & Majerowitz, S. D. (1990). Spouses' provision of support to chronically ill patients. *Journal of Social and Personal Relationships, 7*, 575-586.
- Rusbult, C. E., & Van Lange, P. A. M. (1996). Interdependence processes. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 564-596). New York: Guilford.
- SAS Institute (1990). *SAS/STAT user's guide: Vol. 2, GLM-VARCOMP*. Cary, NC: Author.
- SAS Institute (1997). *SAS/STAT software: Changes and enhancements through release 6.12*. Cary, NC: Author.
- Simpson, J. (1987). The dissolution of romantic relationships: Factors involved in relationship stability and emotional distress. *Journal of Personality and Social Psychology, 53*, 683-692.
- Strack, S., & Coyne, J. C. (1983). Social confirmation of dysphoria: Shared and private reactions to depression. *Journal of Personality and Social Psychology, 44*, 798-806.
- Taylor, J., Underwood, C., Thomas, L., & Zhang, X. (1987). Effects of dysphoria on maternal exchange dispositions. *The Journal of Psychology, 124*, 685-697.



**52nd
Annual
Summer
Institute
in Survey
Research
Techniques**

Presents
a course in

**EVENT
HISTORY
ANALYSIS**

June 14-18, 1999

**Institute for Social Research,
University of Michigan**

**Instructor
Jay Teachman,
Western Washington University**

The emphasis of this course is on hazard-rate models, in which the rate of an event occurring varies according to a set of explanatory variables. Topics will include data structures, life tables, censoring, discrete-time methods, parametric and nonparametric models, time varying covariates, and unobserved heterogeneity.

**For more information on this
and other courses and
workshops contact:**

Dr. James M. Lepkowski, Director
Summer Institute
Survey Research Center
Institute for Social Research
P.O. Box 1248
Ann Arbor, MI 48106-1248
Call toll-free: 877/880-9389
Fax: 734/764-8263
Email: summers@isr.umich.edu
Website: www.isr.umich.edu/src/si/