

19 Grounding Social Psychology in Behavior in Daily Life: The Case of Conflict and Distress in Couples

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The challenge put to participants at the Purdue Symposium was to discuss and perhaps remedy social psychology's neglect of behavior as a focus of research and theory. We the presenters were asked to use the "And Then a Miracle Occurs" New Yorker cartoon as a point of departure for our contributions. Not surprisingly, different presenters took different sources of mirth from the cartoon. For our group, the humor derived from the absurdity of social psychology's ignoring of behavior, of its taking for granted that internal states such as thoughts and feelings have clear implications for behavior. We believe that this is especially true when one considers behavior in the real world as opposed to the laboratory. A social psychology worthy of its name should not only encompass behavior, it should encompass behavior in the real world. Our contribution to the symposium and the edited volume is to demonstrate what social psychology has to gain by adding to its research methods the use of intensive longitudinal designs to study behavior in daily life (e.g., Bolger, Davis, & Rafaeli, 2003).

One of the most consequential behaviors for well-being in daily life is interpersonal conflict. For example, in a large community sample of married couples, interpersonal conflict accounted for over 80% of the explained variance in negative mood (Bolger, DeLongis, Kessler, & Schilling, 1989). Negativity and distress in intimate relationships are

also key predictors of relationship satisfaction and divorce. In a 10-year longitudinal study, Huston, Caughlin, Houts, Smith, and George (2001) found that couples who later divorced had higher levels of negativity and distress early in their marriage than did couples who stayed happily married. Marital conflict has been associated with the onset of depressive symptoms, eating disorders, and alcohol abuse (Fincham, 2003). And although married persons generally enjoy better health than do their unmarried counterparts, marital conflict is associated with poorer physical health. It has been shown that marital conflict alters hormone levels (Kiecolt-Glaser et al., 1997; Malarkey, Kiecolt-Glaser, Pearl, & Glaser, 1994), decreases immune responses (Glaser & Kiecolt-Glaser, 1994), and raises blood pressure (Ewart, Taylor, Kraemer, & Agras, 1991). Over time, these negative marital interactions can lead to chronic health problems (for reviews, see Burman & Margolin, 1992; Kiecolt-Glaser & Newton, 2001). Indeed, marital conflicts have repeatedly been found to even predict poorer health in the children of these couples (Repetti, Taylor, & Seeman, 2002; Troxel & Matthews, 2004).

As costly as conflicts are to couples, they seem to serve an important function. Two studies of newlywed couples over their first 4 years of marriage indicate that marital conflict can allow couples to address problems in the relationship and provide an opportunity to solve them (McNulty, O'Mara, & Karney, 2008). When partners in troubled marriages used benevolent strategies that minimized the impact of negative experiences, instead of addressing them directly, they showed steep declines in relationship satisfaction by allowing problems to worsen over time. Because of these serious and varied implications of conflict, it is important to obtain a detailed picture of conflict behavior as it occurs in daily life.

Conventional measures of marital conflict are often far removed from the actual conflict behaviors. When measures of conflict are obtained, they are typically retrospective summary reports of conflict frequency that are used as components of global marital satisfaction. However, it has been found that even such summary reports of conflict frequency can be more highly predictive of well-being outcomes than the overall satisfaction scales themselves (Johnson, White, Edwards, & Booth, 1986; McGonagle, Kessler, & Schilling, 1992). For example, frequency of marital arguments has been shown to be associated with the onset and remission of clinical depression (Hooley & Teasdale, 1989; Paykel, Myers, & Dienelt, 1969) and daily distressed mood (McGonagle et al., 1992). Despite these far-reaching implications, there has been no rigorous documentation of the temporal patterning of conflicts.

Using Diary Methods

One problem that arises when studying any recurring behavior, including marital conflict, is the tendency for individuals to forget when or to what extent they enacted the behavior. It is known, for example, that retrospective frequency reports can suffer from considerable bias (Schwarz, 1999). Concurrent measurement of behavior using structured daily diaries has been proposed as an alternative that can minimize limitations of memory, problems of estimation, and bias in recall (Bolger, Davis, & Rafaeli, 2003; DeLongis, Hemphill, & Lehman, 1992). Diary measures can capture characteristics of behavior such as timing, frequency, and emotional reactivity that are hard to assess with conventional self-report measures. As Tennen, Affleck, Coyne, Larsen, and DeLongis (2006) point out, emotions are rapidly changing phenomena, and as such, can be assessed reliably only if they are measured close to their real-time occurrence. They argue that although end-of-day recollections of emotional experiences are vulnerable to the retrieval biases that affect episodic memory (Stone, Shiffman, & DeVries, 1999) and are likely to overestimate real-time affective reactions (Barrett, 1997), same-day recollections show high accuracy when compared with more frequent online reports (Thomas & Diener, 1990; Tugade, Conner, & Barrett, in press).

—Bolger and Kelleher (1993) recommended that researchers use daily diaries in characterizing the quality of interpersonal relationships. Although a great deal of research has indicated the importance of marital conflict for well-being, how conflict plays out in the day-to-day lives of couples is unclear. A critical aim of daily diary data is to represent a universe of occasions, just as cross-sectional data aim to represent a population of individuals (Tennen et al., 2006). If the behavior is relatively rare, such as conflict episodes in couples, sampling at random moments during the day is inefficient and likely to miss the behavior of interest. Relatively infrequent behaviors like marital conflict can be recorded reliably, however, at day's end.

In addition to their descriptive capacity, diaries can address a variety of research questions that are relevant for understanding and predicting behavior such as (a) how often the typical person engages in a certain behavior on average, (b) the extent to which the typical person's behavior varies over time, and (c) whether people differ from one another in mean levels and variability over time. In looking at behavioral variability both within and between subjects, researchers are equipped to test theories explaining a particular behavior's antecedents and effects. In the case of marital conflict, for example, some couples seem to never get into a conflict while others fight frequently. It is likely that the typical couple

does not represent this diversity well. Variability in and of itself is rarely explored, and yet it can be quite consequential for all stages of the research process. Since a goal of social psychology is to describe and explain social behavior in general, across a diversity of individuals, it makes sense to examine variability as closely as we examine mean levels. Until recently, this sort of analysis proved difficult to do, but later on in this chapter we will demonstrate how current statistical techniques allow us to more thoroughly examine variability in our sample of couples.

A Dyadic Perspective

When studying marital processes, it is important to take not only the individual into account but rather both spouses' perspectives because these perspectives can differ radically (Jacobson & Moore, 1981; Keefe & Porter, 2007; Lam, Lehman, Puterman, & DeLongis, in press). For example, within a period of stress and tension, partners might differ on the days they report that a marital conflict has occurred. Gable, Reis, and Downey (2003) explored the question of congruence and divergence in partners' perceptions of their daily interactions and found that when one partner reports a negative interaction, even if the other partner does not report such an interaction, there are significant effects on daily mood and relationship satisfaction for *both* partners. Yet very little research on the effects of marital conflict on well-being has obtained reports from both partners, instead relying on one partner's perceptions of marital tension and conflict. Given this, the pathways through which marital conflict exerts its influence on well-being is unclear. When relying exclusively on one partner's perceptions, our assumption that the conflict is critically important to the couple as a whole could be false. Indeed, such conflict and tension may exist only in the eye of the beholder. Examining concordance between spouses in reports of marital conflict and tension affords a better understanding of the influence of marital conflict on the mood of both partners.

Gender is another key variable in studying conflict processes. For example, it has been shown that there are gender-typical patterns in conflict style across husbands and wives. One such pattern that has been studied extensively is the "wife-demand/husband-withdraw" pattern, in which the wife desires a change in the relationship involving some action on the part of the husband, who responds by withdrawing from the conflict and becoming noncommunicative (Sullaway & Christensen, 1983). These findings have been replicated in both clinically distressed couples and community samples (Christensen & Heavey, 1990). However, recent findings suggest that this cycle may be less gender

dependent than previously thought, and more dependent on who in the relationship wants the change (Fincham, 2003). It is the spouse who desires change, regardless of gender, who tends to approach, while the other spouse withdraws. Women more often want change, so more often approach. Women also tend to report more distress in general relative to men, and this increased reporting seems to be due to generally higher levels of distress, rather than a reporting bias or artifact (Mirowsky & Ross, 1995). From these findings, we might expect that in looking at frequency of reported conflicts and daily distress in couples, wives will report more conflicts than husbands, or at least report more distress related to them.

Daily Diary Study of Marital Conflict

It has now been 20 years since Bolger et al. (1989) published their report on daily stressors in a large sample of married couples. In the intervening years there have been major developments in statistical modeling that can usefully be applied to this data set. The goal of this chapter, therefore, is to revisit the Bolger et al. (1989) diary data set to provide a more fine-grained analysis of marital conflict than was possible using the statistical methods available two decades ago. The 1989 paper focused on mean levels of conflict and mood but left unaddressed the question of variability and covariability across spouses. With modern analytic methods, rigorous assessment of variability in conflict frequency and emotional reactivity can now be considered.

The specific questions that can be addressed now that could not be addressed then are (a) to what extent do couples differ from one another in their levels of marital conflict and their emotional reactivity to those conflicts, and (b) to what extent are husbands who show high levels of marital conflict exposure and reactivity paired with wives who show corresponding levels.

In our study, each partner independently filled out a background questionnaire and then a diary over a maximum period of 42 consecutive diary days. Husbands and wives were mailed their diaries separately and returned them in separate envelopes. Each partner was asked to apply adhesive strips to seal the day's diary after completion to ensure confidentiality. The diary study itself was part of the Detroit Area Study, which comprised a random community sample of 778 married couples in metropolitan Detroit. Of these, 400 couples were invited to be in a supplementary diary study. The final sample for this study is the 150 couples in which both partners filled out at least seven daily diaries regarding marital conflicts and daily distress. Further details on the

sample can be found in Bolger et al. (1989). We assessed marital conflict with the item: "We would like to know about any tension or argument you had with any of these people during the past 24 hours. Please check each box that applies." If a subject had checked the box for "Your wife/husband," then we coded the day as a marital conflict day. The diary also included an inventory of 18 mood items from the Affects Balance Scale (Derogatis, 1975) designed to measure clinical levels of anxiety (e.g., nervous, tense, afraid), hostility (e.g., irritable, angry, resentful), and depression (e.g., helpless, worthless, depressed). On the basis of their emotional state over the previous 24-hour period, respondents were asked to rate each of the 18 items on a 4-point scale ranging from "not at all" to "a lot" with the instruction: "Circle the number that best describes your feelings during the past 24 hours." Responses to all items were combined and rescaled to create a summary measure of distressed mood, which ranged from 0 (all items endorsed "not at all") to 1 (all items endorsed "a lot"). The scale had high internal consistency (Cronbach's $\alpha = .91$). The mean was .09, and the standard deviation was .14.

New Findings on Exposure to Daily Conflict

Although previously published papers using this data set have reported on exposure to daily conflict (Bolger et al., 1989), and heterogeneity in exposure as a function of personality (Bolger & Schilling, 1991), our approach here is in some respects more and less ambitious than the previous work. It is less ambitious in the sense that we do not attempt to explain *why* couples differ in exposure. It is more ambitious, however, in attempting to estimate the full extent of the heterogeneity. To do so we use each husband's and wife's independent report of marital conflict each day as data and estimate a multilevel logistic regression model that specifies a population distribution of probabilities of reporting conflict across all days, separately for husbands and wives. The model provides estimates of the mean and variance of these distributions and their correlation. The reader may wonder why, given that husbands and wives are reporting on the same event, we do not first of all attempt some reconciling of the reports prior to data analysis. We could have, for example, taken the average, the union, or the intersection of the two reports. We chose instead to allow the results of the multilevel analysis to tell us the extent to which husbands and wives agree or disagree about the typical level of conflict between them.

Details on the multilevel logistic model estimation are presented in the Appendix. We focus here on the key results. First, on average do husbands and wives agree on the level of conflict between them? For husbands, the log-odds of a marital conflict for any given day is -3.3 , which corresponds to a probability of $.036$ (95% CI: $.028, .046$). For wives, the log-odds is -3.1 , which corresponds to a probability of $.043$ (CI: $.034, .054$). Although the estimated probability of conflict for wives is somewhat higher than that for husbands, the estimates do not differ significantly ($t(148) = 1.38, p = .17$), and therefore we cannot rule out the hypothesis that husbands and wives are in agreement about their engagement in marital conflict. If we use the average of the two partners' estimates as the best guess as to the overall level of marital conflict, we obtain an estimate of $.041$, which corresponds to a little over one conflict per month. This is consistent with what others have reported, with Fincham (2003) pointing out in his review that about 80% of couples report having less than one overt disagreement per month.

A second way to assess agreement between husbands and wives is through calculating the correlation between their average reports across couples. Specifically, do husbands who have relatively high log-odds of conflict tend to be paired with wives who are also relatively high? Using the multilevel analysis we observed that the degree of correlation between husbands and wives across couples was very high, $r(148) = .86$ (CI: $0.81, 0.90$), sufficiently high to meet typical standards in psychometrics for parallel measures (Nunnally & Bernstein, 1994). Note, however, that the confidence interval allows us to exclude population values greater than $.90$. Thus, while the correlation is impressive, we can nonetheless be very confident that the correlation between spouses is not perfect in the population. This discrepancy is interesting in its own right and deserves further investigation.

Although the key results of multilevel analyses involve estimates of population means, variances, and correlations of random effects, further insight into the data can be gained by obtaining what can be called posterior estimates of the random effects for the sample (also known as empirical best linear unbiased predictors, or EBLUPs; Littell, Milliken, Stroup, Wolfinger, & Schabenberger, 2006). In this way it is possible to see what the model's best guess is for—in the present example's case—the probability of conflict for each of the husbands and wives in each of the 150 couples in our sample. Figure 19.1, therefore, displays a scatterplot of model-estimated probabilities of marital conflict for husbands (on the y-axis) and wives (on the x-axis).

Figure 19.1 shows that although the average probability of conflict is approximately $.04$, there is large variability in that probability across couples. The predicted conflict engagement probabilities in the sample

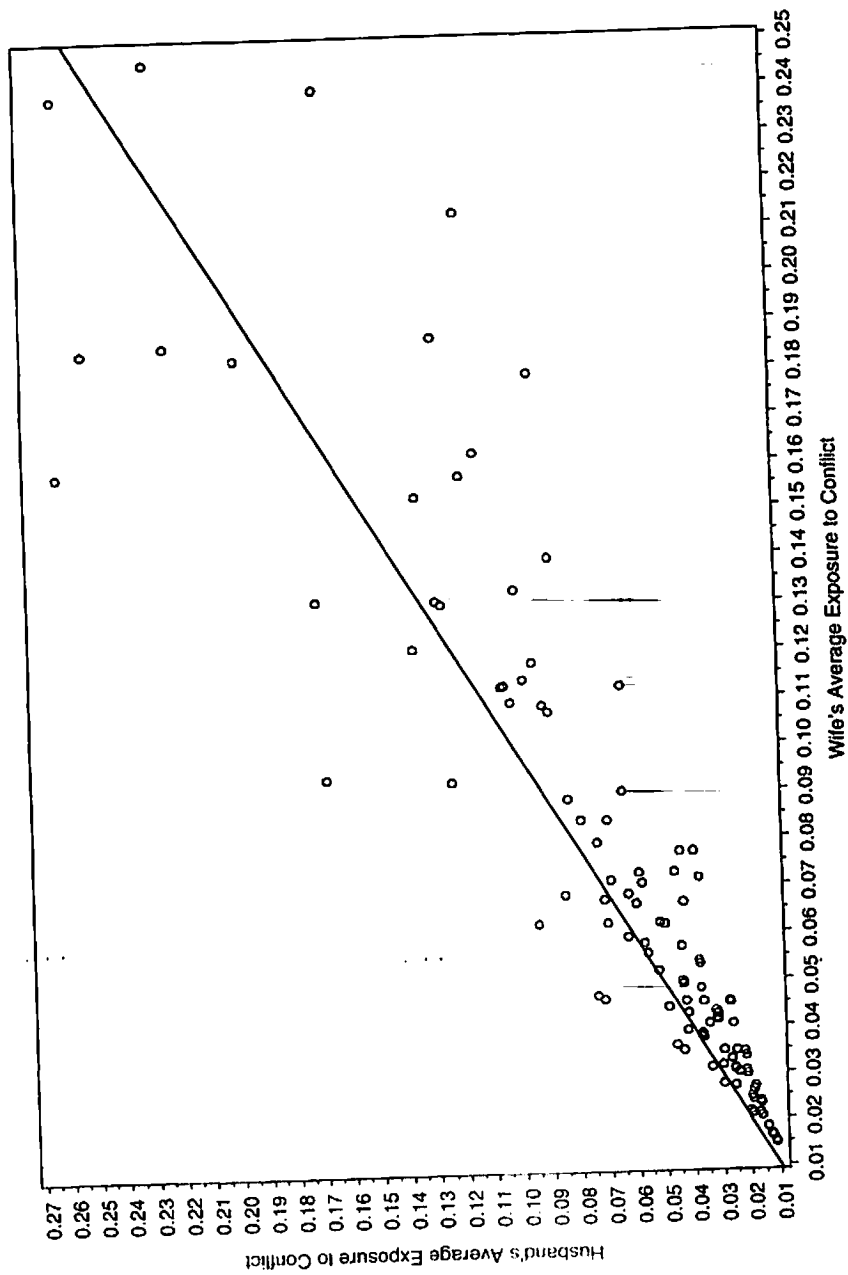


Figure 19.1. Husband's and Wife's Average Exposure to Conflicts Over 42 Diary Days: Model-Based Estimates. (Note: Each point represents one couple).

range from .01 to .24 for women and from .01 to .26 for men. Recall that these are model predictions for the sample. Consistent with these values, the estimated 95% range of *population values* based on the model is .004 to .25 for wives and from .006 to .25 for husbands. There is no evidence of population gender differences in the between-person variability ($t(148) = .63, p < .53$).

Figure 19.1 also shows a line of perfect agreement between spouses. Although it appears that more points fall below the line than above, a test of whether the regression lines of husband scores on wife score differs from 1.0 was nonsignificant. Similarly, a test of whether the regression of wives' scores on husbands' scores differed from 1.0 was also not statistically significant. Thus, we cannot reject the hypothesis that the means for husbands and wives are identical and also that scores are distributed evenly around a line of perfect agreement.

In summary, we have found that although rates of marital conflict reported in the diaries are low, there is substantial between-couples heterogeneity in those rates, and there is a high level of agreement between spouses regarding those rates. This high level of agreement supports the idea that the diary reports are revealing actual behavioral episodes visible to both partners. If people were not able to accurately recall the events of the day, or if they were reporting on internal states rather than behaviors they enacted, one would not expect such agreement across partners.

Daily Distress in a Dyadic Context

The second goal of this paper is to document between-couple heterogeneity in reactivity to marital conflict, and we move now to a statistical model that incorporates daily conflicts as a predictor of daily distress. Such a model allows us to distinguish days on which individuals reported that no marital conflict occurred and days on which they reported that a conflict occurred. Using that information we will focus on two outcomes: First, how distressed are husbands and wives on no-conflict days? Given that conflicts occurred approximately once a month on average, these correspond to the vast majority of days. Second, how much more distressed are husbands and wives when they experience a conflict, defined as how much more distressed they were on days when they reported having a marital conflict than on days when they did not. As in the case of the occurrence of conflicts, we will also determine the correlation between the two outcomes across couples. The appendix contains the details on the statistical model used.

Average distress on no-conflict days. The multilevel analysis produced estimates of means and standard deviations of distress on no-conflict days for husbands and wives. Overall, distress levels were very low, and we found no evidence of gender differences in distress. The average husband was estimated to have a mean distress (on a 0 to 1 scale) of 0.085 (CI: 0.073, 0.097); the average wife also had a mean distress of 0.085 (CI: 0.074, 0.096; $t_{diff}(146) = .02, p < .99$).

Although husbands and wives in our sample had identical distress levels on average, there was evidence of a gender difference in variability: The between-couple standard deviation was larger for husbands ($SD = .075$, CI: .066, .084) than for wives ($SD = .063$, CI: .055, .070; $t_{diff}(146) = 2.06, p < .041$). The confidence interval for the difference ranged from essentially no gender difference to husbands having a standard deviation of .024 greater than wives.

Figure 19.2 shows a scatterplot of the posterior estimates of the random effects for husbands' and wives' average distress on no-conflict days. They show only a slight tendency for distressed husbands to be paired with distressed wives. The between-couple correlation between these random effects is small ($r = .27, t(146) = 2.84, p < .0045$). There are plenty of examples of relatively distressed husbands who have wives who show low distress and vice versa. These findings are somewhat surprising given multiple theoretical models that posit an interrelationship in mood between members of a couple. Primary among these are models of mood contagion (Joiner & Katz, 1999), which argue that one spouse's negative affect would "infect" the other. Second, negative affect in both partners has been posited to coexist due to assortative mating. For example, evidence suggests that depressed individuals may select a similarly depressed mate (Maes et al., 1998; Mathews & Reus, 2001). Yet our findings suggest that in examining couples' mood at a day-to-day level, evidence for both mood contagion and assortative mating appears to be small.

Perhaps not surprisingly, there is a relative absence of couples who are both relatively high on distress. High distress levels in both partners could indicate that the couple is going through a mutual life stressor, or that their relationship is troubled. Such couples are likely to choose not to participate in a study of this nature because the time and commitment needed might be overwhelming. Furthermore, it could be that marriages characterized by the presence of high distress in both members of the couple are unstable and less viable in the long-term, making these couples more rare in a sample.

Reactivity to Daily Conflict. Consistent with the original Bolger et al. (1989) report, both husbands and wives show strong reactivity to marital

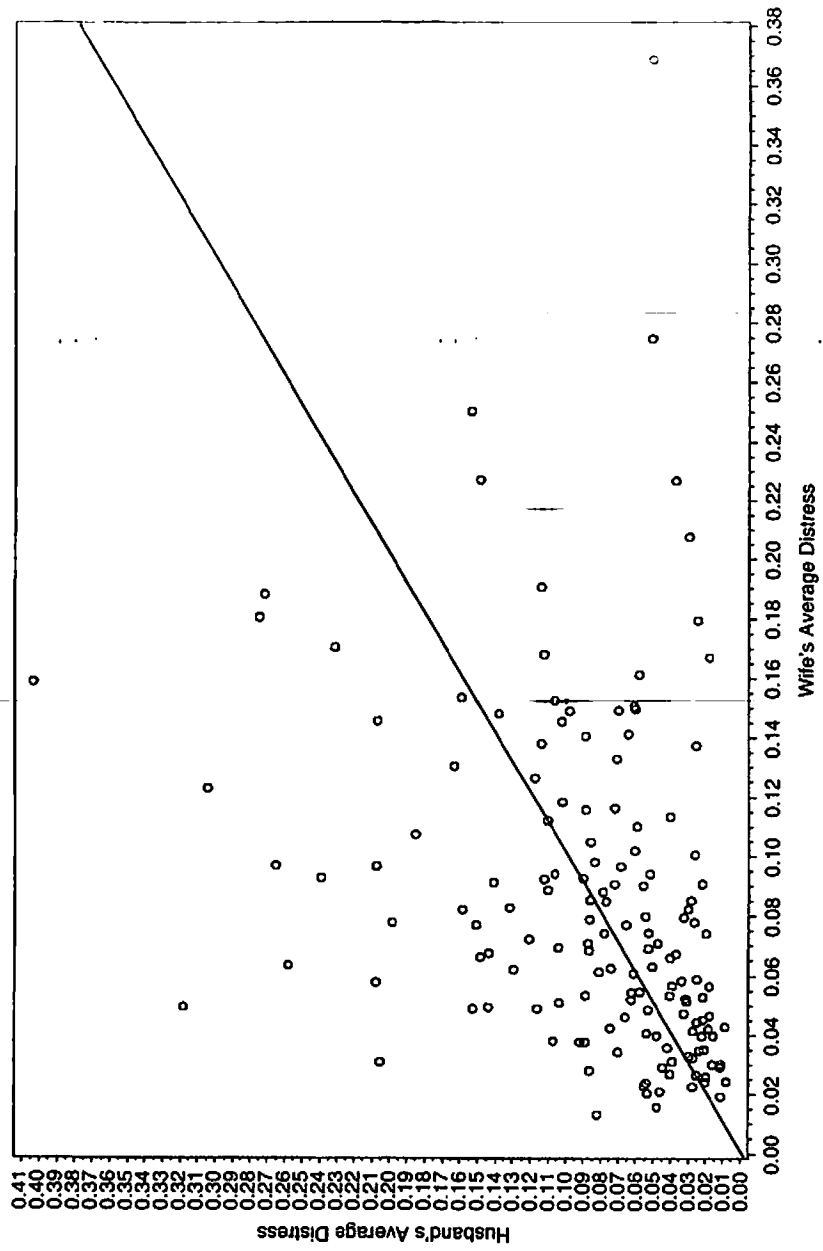


Figure 19.2. Husband's and Wife's Average Distress on No-Conflict Days Over 42 Diary Days; Model-Based Estimates (Note: Each point represents one couple).

conflict on the same day. The average coefficient for husbands is 0.110 units (CI: 0.088, 0.131); the equivalent for wives is 0.139 (CI: 0.111, 0.167). Bolger et al. concluded that wives were more reactive to marital arguments than were their husbands. Using the current statistical framework we do not have sufficient power to be confident of that claim. The confidence interval for the difference ranges from -0.002 indicating no difference in reactivity to 0.062 indicating that females could be twice as reactive as males ($t(146) = 1.81, p < .071$).

A question that was not posed by Bolger et al. (1989)—and could not have been posed given their statistical model—was whether husbands as a group were more or less variable in their reactivity than wives as a group. The standard deviation in reactivity for husbands was 0.091 (CI: 0.071, 0.111) and for wives was 0.127 (CI: 0.105, 0.149). Based on these estimates we conclude that wives are more heterogeneous than husbands in their reactivity to marital conflicts ($t_{diff}(146) = -2.48, p < .014$). Finally, as in the case of distress on no-conflict days, there is only a weak positive relationship between husbands' and wives' reactivity, $r(146) = .26, t(146) = 1.56, p < .120$.

Figure 19.3 shows a scatterplot of the posterior estimates of husbands' and wives' conflict reactivity in our sample. The univariate distributions are both positively skewed, and we have separated the plot into quadrants based on the median values in the sample. To give the reader a better understanding of the diary records for these combinations of reactivity, we present in Figure 19.4 plots of the occurrence of conflict and levels of daily distress in a selection of specific couples highlighted by circles in Figure 19.3.

By looking at the level of individual couples (see Figure 19.4), we are able to detect patterns that at the between-couples level would not be evident. For example, we can see that although on average agreement about conflict days is high, couples do not always agree on the specific days on which they argued with each other. Often, we see a pattern in which there is an overall agreement on a period of conflict, though the partners may report their conflicts a day or two off from each other. We hope to examine this further, to determine whether broad conflict periods are more highly predictive of distress than particular conflict days. This might be expected because we are able to see that at times a wife may report a conflict that her husband does not (or vice versa), but both of them experience an increase in distress on that day.

In Figure 19.4, for each of four combinations of husband-wife reactivity (high-high, low-low, average-average, high-low/low-high), two representative couples are displayed. For each couple, there is a husband panel above a corresponding wife panel. Within each panel, the higher line

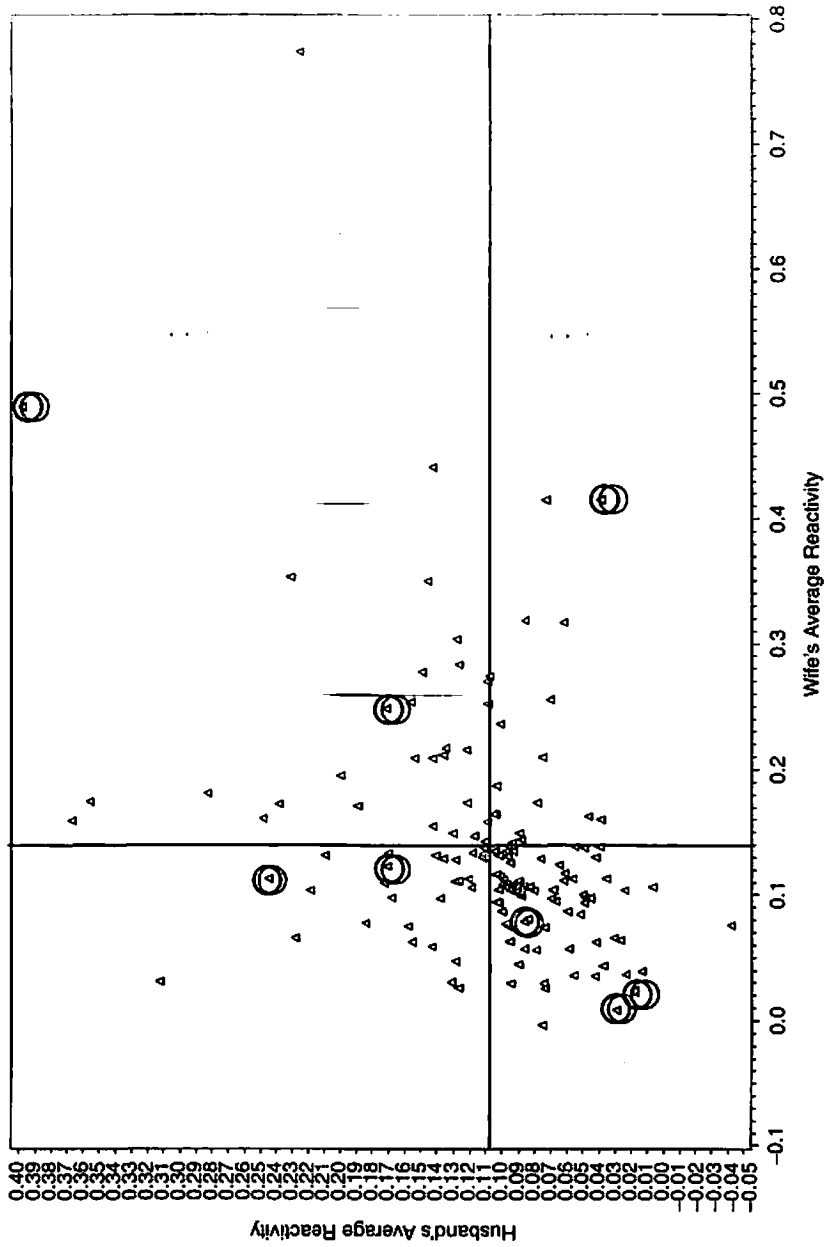


Figure 19.3. Husband's and Wife's Average Reactivity to Conflicts Over 42 Diary Days: Model-Based Estimates (Note: Each point represents one couple).

plots daily distress (on a scale from 0, no distress reported, to 1, maximum distress), and the lower line plots reports of marital conflict (on days when a conflict is reported, the lower plot spikes up from its baseline value of no conflict). This structure allows us to compare husbands' and wives' timing of conflict reports, and to compare husbands and wives on their emotional reactivity to reported conflicts.

In Figure 19.4a, the pattern represented is of a highly distressed response in both partners to a marital conflict. It can be seen that in both couples, partners agree on some of the conflict days, but not on all of them. For Couple 1 there seems to be agreement on a general period of conflict, which the husband reports on and off, and the wife reports as a multiple-day spell. In Couple 2, we see that the wife reports two days of conflict at the end of the diary period that the husband does not report, though he does have a corresponding rise in distress. Figure 19.4b displays examples of the opposite pattern of reactivity—both partners are low in

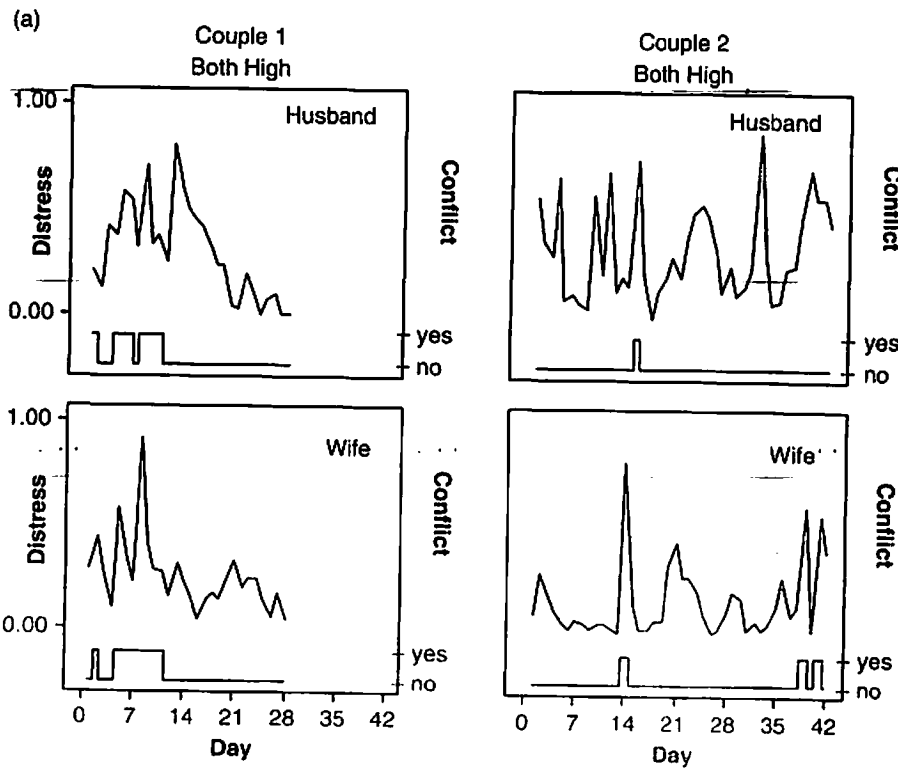


Figure 19.4. Distress and Conflict for Eight Couples. (a) Both partners show high reactivity on conflict versus nonconflict days. (b) Both partners show low reactivity on conflict versus nonconflict days. (c) Both partners show average reactivity on conflict versus nonconflict days. (d) Couples with mixed reactivity on conflict versus nonconflict days.

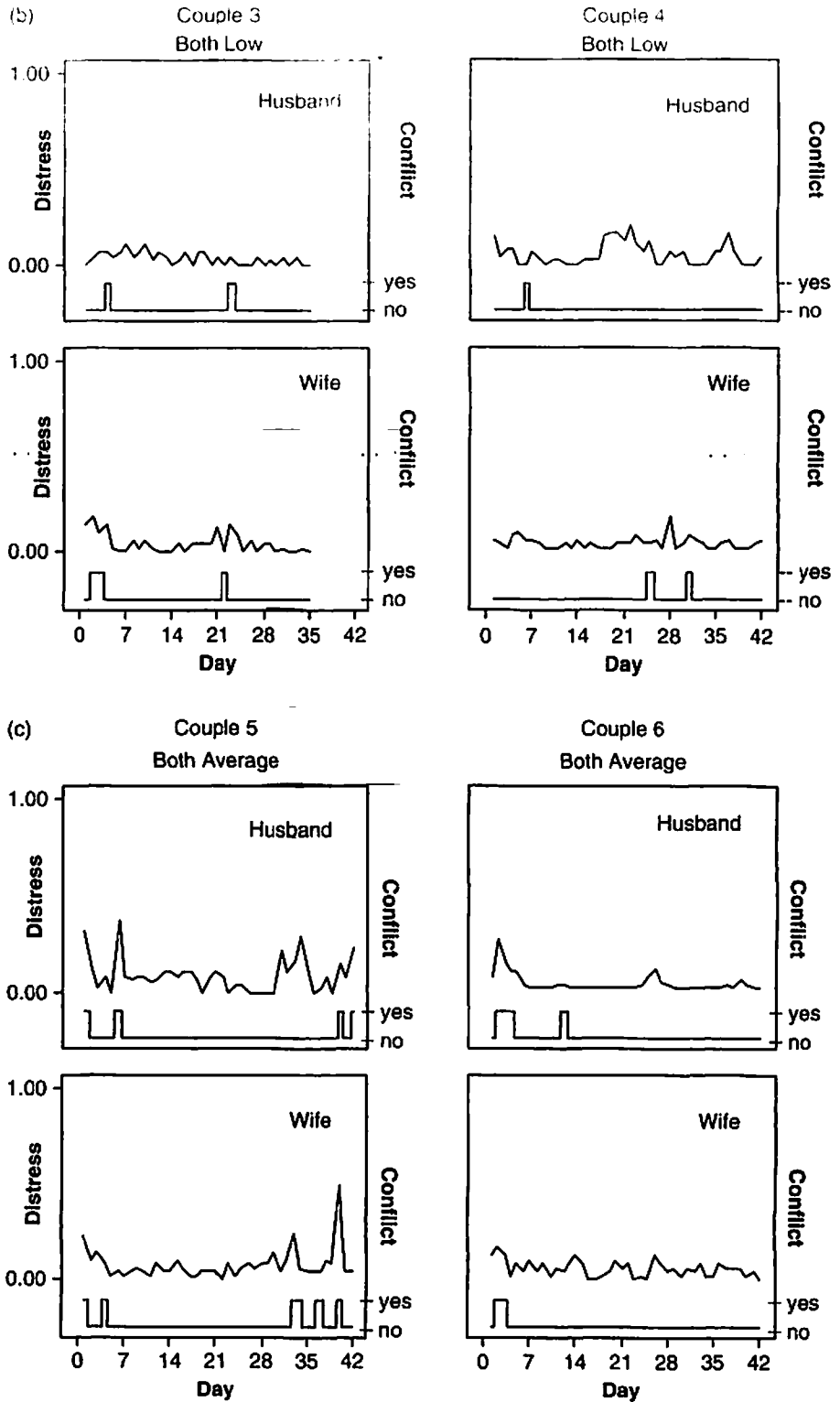


Figure 19.4. Continued.

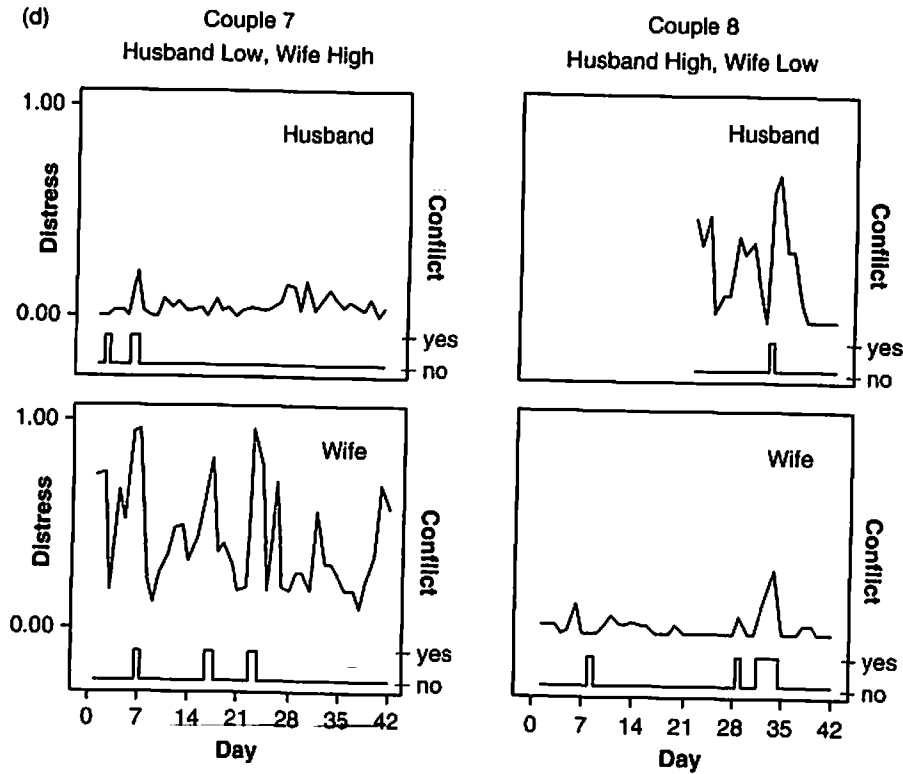


Figure 19.4. Continued.

reactivity to conflict. We can see that both of these couples are low in distress overall, and that they do not show a distressed response on days of reported conflict. Figure 19.4c displays examples of couples in which both partners have average reactivity to conflict. Finally, Figure 19.4d shows examples of two couples in which the partners are discordant on reactivity—one partner is highly reactive to conflict, while the other partner is not.

SUMMARY AND DISCUSSION OF KEY FINDINGS

This reanalysis of the Bolger et al. (1989) data yielded two new sets of findings. The first concerned exposure to marital conflicts. We found striking heterogeneity across couples in exposure to conflict, and at the same time strong overall consensus between husbands and wives about their typical exposure. This high agreement between partners supports the claim that conflict reports correspond to actual daily interpersonal behaviors. Further, couples in the current study also showed evidence of multiday periods of tension, in which

one or both partners reported conflicts over several days. This finding deserves further attention as it may indicate that couples need several attempts to resolve a marital conflict before they find a satisfactory solution (McNulty et al., 2008).

The second set of new findings concerned emotional reactivity to conflicts. Here again there were large between-couple differences, but there were also large within-couple differences. We documented these reactivity results by providing daily profiles of conflict and distress for couples with similar and different combinations of reactivity. Interestingly, we did not find an equal distribution of couples within these groups. There were very few high-high reactivity couples, perhaps due to the fact that two people who both react to conflict with a great degree of distress may not be able to function as a couple over the long-term. Ineffective coping with conflict has been shown to be predictive of divorce (Gottman & Levenson, 1999).

Note that there was also both between- and within-couple heterogeneity in distress on days of no conflict (the vast majority of days for most couples). The within-couple heterogeneity may surprise some readers in that there were approximately equal numbers of couples in which husbands were more distressed than their wives as there were couples in which wives were more distressed than their husbands on no-conflict days.

Contrary to the findings of Bolger et al. (1989), we did not find a significant gender difference in reactivity to conflict, although the confidence interval for the effect just barely included zero. Earlier research led us to expect a more highly distressed reaction to conflict in wives than in husbands, but the current results present a picture of great heterogeneity across both husbands and wives, so much so that they tend to dwarf average differences between husbands and wives. The fixed-effects analysis approach used in the 1989 study had ignored this within-group heterogeneity.

When researching behavior, how the typical person behaves and reacts is one important piece of information. Equally important, however, is the question of how much people differ in behavior and reaction (Bolger et al., 2003). The individuals in the current study varied vastly in conflict occurrence and also in distress on conflict and no-conflict days. In this case, taking into account how much individuals and couples differ is essential to describing what is actually going on in the sample. With adequate statistical models in place to describe typical levels and variability in behavior, the next step in research will be to get at the sources of variability (e.g., relationship satisfaction, communication patterns, personality).

Further research with similar designs including diary reports from both partners will help to shed light on the mechanisms explaining how marital conflict influences health (Burman & Margolin, 1992; Kiecolt-

Glaser & Newton, 2001). For example, DeLongis, Capreol, Holtzman, O'Brien, and Campbell (2004) found that only couples with low marital satisfaction tended to evidence mood disturbance when there was an absence of positive interactions with the spouse. Those high in marital satisfaction appeared to weather the natural ups and downs of married life without distress.

One limitation of the current study is that the question of the causal relation between conflict and distress cannot be answered based on the available data. Although it is highly likely that conflicts cause distress, high distress might also make conflicts more likely. Because conflict and distress were measured at the same time, we cannot be sure about the causal direction between them. To address this limitation, a study design where partners report on their distress before one or both come home from work and then again at night before going to bed would allow researchers to parse apart the contribution of distress to conflict and conflict to distress. In a study examining the effects of marital interactions on mood (DeLongis et al., 2004), negative interactions with the spouse were associated with same-day declines in mood. However, they had a significant effect on next-day mood only when there was also a dearth of positive interactions with the spouse.

A second limitation is that the behavior in question—conflict—was not directly observed. Although we have not directly observed husbands and wives in their daily arguments, we can be fairly confident that our daily diary reports are capturing actual behavior due to the level of agreement in couples on the average frequency of their conflicts. Supplementing diary data like the ones we have used for this analysis with lab sessions (e.g., conflict discussions) will allow us to further understand and describe behavior by supplementing individual reports with objective measures like observation and psychophysiological methods. However, adequately capturing behavior is an ongoing challenge for researchers. Although it has been argued that studying what couples say about themselves is not a substitute for studying how they behave (Raush, Barry, Hertel, & Swain, 1974), studies that rely exclusively on laboratory enactments of marital conflict may be anything but natural. Combining daily diary reports of behavior with observational research may be one way to find such a balance.

The most noteworthy implication of the analyses conducted here is the support they lend to the call to move beyond a focus on the typical person and to allow for a closer examination of the heterogeneity across persons. In following people across time using daily diary methods, we can study the person in a variety of naturally occurring contexts, examining how their behavior changes from day to day and from situation to situation. With new methods of data collection and analysis that allow

this broader view, social psychologists are better able to ground their theories in the realities of daily behavior.

APPENDIX

This data set, based on the sample of 150 couples and 28 days, was structured such that variables from each daily report for each partner were placed on a separate data line, giving a maximum of $2 \times 42 = 84$ observations for each couple. The data set also contained two dummy variables, husband (coded 1 when a data line came from the husband and 0 when it came from the wife), and wife (coded 1 when a data line came from the wife and 0 when it came from the husband). Laurenceau and Bolger (2005) provide more details on data organization of this type.

To model average exposure to marital conflict, we used a multilevel logistic regression model where each husband and wife had his or her own log-odds of reporting a marital conflict. The level 1 equation was:

$$\log \frac{p_{it}}{1 - p_{it}} = \beta_{hi}H_{it} + \beta_{wi}W_{it}.$$

The log odds for husband in couple i , β_{hi} , and wife in couple i , β_{wi} , were assumed to vary across individuals, and this variation was assumed to be normally distributed with mean

$$\begin{bmatrix} \gamma_h \\ \gamma_w \end{bmatrix}$$

and covariance matrix

$$\begin{bmatrix} \tau_h^2 & \tau_{hw} \\ \tau_{wh} & \tau_w^2 \end{bmatrix},$$

where τ_h^2 is the variance of γ_h , τ_w^2 is the variance of γ_w , and $\tau_{hw} = \tau_{wh}$ is the covariance between husband and wife log-odds.

Using the data structure described above, this model can be estimated using the NLMIXED procedure in SAS (SAS Institute, 2002). The key SAS commands required are shown below.

```
PROC NLMIXED DATA = diarydataset;
b0h = g0h + u0h;
b0w = g0w + u0w;
eta = b0h*husband + b0w*wife;
p = 1/(1 + EXP(-eta));
MODEL conflict~BINARY(p);
```

RANDOM $u_{0h} u_{0w} \sim \text{NORMAL}([0,0],[s_{2uh},chw,s_{2uw}])$
 subject = coupleid;
 PARMS $g_{0h} = -3 g_{0w} = -3 s_{2uh} = 1 chw = .9 s_{2uw} = 1;$

To model reactivity to conflict in the same data set, we used the following multilevel model

$$Y_{it} = \beta_{hi}H_{it} + \beta_{wi}W_{it} + \beta_{chi}CH_{it} + \beta_{cwi}CW_{it} + \epsilon_{it}.$$

We assume that the four β s are normally distributed with mean vector

$$\begin{bmatrix} \gamma_h \\ \gamma_w \\ \gamma_{ch} \\ \gamma_{cw} \end{bmatrix}$$

and covariance matrix

$$\begin{bmatrix} \tau_h^2 & \tau_{hw} & \tau_{hch} & \tau_{hchw} \\ \tau_{wh} & \tau_w^2 & \tau_{wch} & \tau_{wchw} \\ \tau_{chh} & \tau_{chw} & \tau_{ch}^2 & \tau_{chcw} \\ \tau_{cwh} & \tau_{cww} & \tau_{cchw} & \tau_{cw}^2 \end{bmatrix}$$

Given that there are a maximum of 84 observations per couple, there are also a maximum of 84 observed values for ϵ_{it} . We assume that these are normally distributed with a mean of 0 and an 84×84 covariance matrix that is a Kronecker product of (i) a 2×2 covariance matrix representing variances and covariances of husband and wife scores on an given day and a 42×42 covariance matrix for across time dependencies. We assume the latter to have an AR(1) structure. The error specification, therefore, is

$$\begin{bmatrix} \sigma_h^2 & \sigma_{hw} \\ \sigma_{wh} & \sigma_w^2 \end{bmatrix}_{2 \times 2} \otimes \begin{bmatrix} 1 & \rho & \rho^2 & \dots & \rho^{41} & \rho^{42} \\ \rho & 1 & \rho & \dots & \rho^{41} & \rho^{42} \\ \rho^2 & \rho & 1 & \dots & \rho^{41} & \rho^{42} \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ \rho^{41} & \rho^{41} & \dots & \rho & 1 & \rho \\ \rho^{42} & \rho^{41} & \dots & \rho^2 & \rho & 1 \end{bmatrix}_{42 \times 42}$$

See Bolger and Shrout (2007) for more details on this approach to modeling dyadic data.

The model can be estimated using the MIXED procedure in SAS (SAS Institute, 2002). The key commands required are:

```
PROC MIXED data = diarydataset covtest;
CLASS coupleid sex diary_day;
```

MODEL distress – husband wife conflict*husband conflict
 *wife /noint solution;
 RANDOM husband wife conflict*husband conflict
 *wife /subject = coupleid type = un s g g:orr;
 REPEATED sex diary_day /subject = coupleid type = un@ar(1);

REFERENCES

- Barrett, L. F. (1997). The relationship among momentary emotional experiences, personality descriptions, and retrospective ratings of emotion. *Personality and Social Psychology Bulletin*, 23, 1100-1110.
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods. *Annual Review of Psychology*, 54, 579-616.
- Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology*, 57, 808-818.
- Bolger, N., & Kelleher, S. (1993). Daily life in relationships. In S. W. Duck (Ed.), *Social context and relationships*. Newbury-Park, CA: Sage.
- Bolger, N., & Schilling, E. A. (1991). Personality and the problems of everyday life: The role of neuroticism in exposure and reactivity to daily stressors. *Journal of Personality*, 59, 355-386.
- Bolger, N., & Shrout, P. E. (2007). Accounting for statistical dependency in longitudinal data on dyads. In T. D. Little, J. A. Bovaird, & N. A. Card (Eds.), *Modeling contextual effects in longitudinal studies* (pp. 285-298). Mahwah, NJ: Erlbaum.
- Burman, B., & Margolin, G. (1992). Analysis of the association between marital relationships and health problems: An interactional perspective. *Psychological Bulletin*, 112, 39-63.
- Christensen, A., & Heavey, C. L. (1990). Gender and social structure in the demand/withdraw pattern of marital conflict. *Journal of Personality and Social Psychology*, 59, 73-81.
- DeLongis, A., Capreol, M. J., Holtzman, S., O'Brien, T. B., & Campbell, J. (2004). Social support and social strain among husbands and wives: A multilevel analysis. *Journal of Family Psychology*, 18, 470-479.
- DeLongis, A., Hemphill, K. J., & Lehman, D. R. (1992). A structured diary methodology for the study of daily events. In F. B. Bryant, J. Edwards, L. Heath, E. J. Posanac, & R. S. Tinsdale (Eds.), *Methodological issues in applied social psychology* (pp. 83-109). New York: Plenum Press.
- Derogatis, L. R. (1975). *Affects balance scale*. Baltimore, MD: Clinical Psychometrics Research Unit.
- Ewart, C. K., Taylor, C. B., Kraemer, H. C., & Agras, W. S. (1991). High blood pressure and marital discord: Not being nasty matters more than being nice. *Health Psychology*, 10, 155-163.
- Fincham, F. (2003). Marital conflict: Correlates, structure, and context. *Current Directions in Psychological Science*, 12, 23-27.

- Gable, S. L., Reis, H. T., & Downey, G. (2003). He said, she said: A quasi-signal detection analysis of spouses' perceptions of everyday interactions. *Psychological Science, 14*, 100-105.
- Glaser, R., & Kiecolt-Glaser, J. K. (1994). Stress-associated immune modulation and its implications for reactivation of latent herpesviruses. In R. Glaser, & Jones, J. (Ed.), *Human Herpesvirus Infections* (pp. 245-270). New York: Dekkar.
- Gottman, J. M., & Levenson, R. W. (1999). Rebound from marital conflict and divorce prediction. *Family Process, 38*, 287-292.
- Hooley, J. M., & Teasdale, J. D. (1989). Predictors of relapse in unipolar depressives: Expressed emotion, marital distress, and perceived criticism. *Journal of Abnormal Psychology, 98*, 229-235.
- Huston, T. L., Caughlin, J. P., Houts, R. M., Smith, S. E., & George, L. J. (2001). The connubial crucible: Newlywed years as predictors of marital delight, distress, and divorce. *Journal of Personality and Social Psychology, 80*, 281-293.
- Jacobson, N. S., & Moore, D. (1981). Spouses as observers of events in their relationships. *Journal of Consulting and Clinical Psychology, 49*, 269-277.
- Johnson, D. R., White, L. K., Edwards, J. N., & Booth, A. (1986). Dimensions of marital quality: Toward methodological and conceptual refinement. *Journal of Family Issues, 7*, 31-49.
- Joiner, T. E., Jr., & Katz, J. (1999). Contagion of depressive symptoms and mood: Meta-analytic review and explanations from cognitive, behavioral, and interpersonal viewpoints. *Clinical Psychology: Science and Practice, 6*, 149-164.
- Keefe F. J., & Porter, L. (2007). Pain catastrophizing in the context of satisfaction with spousal responses: New perspectives and new opportunities. *Pain, 131*, 1-2.
- Kiecolt-Glaser, J. K., Glaser, R., Cacioppo, J. T., MacCallum, R. C., Snyder-Smith, M., Kim, C., et al. (1997). Marital conflict in older adults: Endocrinological and immunological correlates. *Psychosomatic Medicine, 59*, 339-349.
- Kiecolt-Glaser, J. K., & Newton, T. L. (2001). Marriage and health: His and hers. *Psychological Bulletin, 127*, 472-503.
- Lam, M., Lehman, A. J., Puterman, E., & DeLongis, A. (in press). Spouse depression and disease course among persons living with rheumatoid arthritis. *Arthritis Care & Research*.
- Laurenceau, J. P., & Bolger, N. (2005). Using diary methods to study marital and family processes. *Journal of Family Psychology, 19*, 86-97.
- Littell, R. C., Milliken, G. A., Stroup, W. W., Wolfinger, R. D., & Schabenberger, O. (2006). *SAS for mixed models* (2nd ed.). Cary, NC: SAS Institute.
- Malarkey, W. B., Kiecolt-Glaser, J. K., Pearl, D., & Glaser, R. (1994). Hostile behavior during marital conflict affects pituitary and adrenal hormones. *Psychosomatic Medicine, 56*, 41-51.
- Mathews, C. A., & Reus, V. I. (2001). Assortative mating in the affective disorders: A systematic review and meta-analysis. *Comparative Psychiatry, 42*, 257-262.
- Maes, H. H. M., Neale, M. C., Kendler, K. S., Hewitt, J. K., Silberg, J. L., Foley, D. L., et al. (1998). Assortative mating for major psychiatric diagnoses in two population-based samples. *Psychological Medicine, 28*, 1389-1401.

- McGonagle, K. A., Kessler, R. C., & Schilling, E. P. (1992). The frequency and determinants of marital disagreements in a community sample. *Journal of Social and Personal Relationships, 9*, 507-524.
- McNulty, J. K., O'Mara, E. M., & Karney, B. R. (2008). Benevolent cognitions as a strategy of relationship maintenance: "Don't sweat the small stuff" . . . But it is not all small stuff. *Journal of Personality and Social Psychology, 94*, 631-646.
- Mirowsky, J., & Ross, C. E. (1995). Sex differences in distress: Real or artifact? *American Sociological Review, 60*, 449-468.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Paykel, E. S., Myers, J. K., & Dienelt, M. (1969). Life-events and depression. *Archives of General Psychiatry, 31*, 753-760.
- Raush, H. L., Barry, W. A., Hertel, R. K., & Swain, M. A. (1974). *Communication, conflict, and marriage*. San Francisco: Jossey-Bass.
- Repetti, R. L., Taylor, S. E., & Seeman, T. E. (2002). Risky families: Family social environment and the mental and physical health of offspring. *Psychological Bulletin, 128*, 330-366.
- SAS Institute. (2002). *SAS 9.1.3 help and documentation*. Cary, NC: Author.
- Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist, 54*, 93-105.
- Stone, A. A., Shiffman, S. S., & DeVries, M. W. (1999). Ecological momentary assessment. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well being: The foundations of hedonic psychology* (pp. 26-39). New York: Russell Sage Foundation.
- Sullaway, M., & Christensen, A. (1983). Assessment of dysfunctional interaction patterns in couples. *Journal of Marriage and the Family, 45*, 653-660.
- Tennen, H., Affleck, G., Coyne, J. C., Larsen, R. J., & DeLongis, A. (2006). Paper and plastic in daily diary research: Comment on Green, Rafaeli, Bolger, Shrout, and Reis (2006). *Psychological Methods, 11*, 112-118.
- Thomas, D. L., & Diener, E. (1990). Memory accuracy in the recall of emotions. *Journal of Personality and Social Psychology, 59*, 291-297.
- Troxel, W. M., & Matthews, K. A. (2004). What are the costs of marital conflict and dissolution to children's physical health? *Clinical Child and Family Psychology Review, 7*, 29-57.
- Tugade, M. M., Conner, T., & Barrett, L. F. (2007). Assessment of mood. Chapter to appear in S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman, and R. West (Eds.), *The Cambridge Handbook of Psychology, Health, and Medicine (2nd Edition)*. Cambridge UK: Cambridge UP.