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A Valid Procedure for Obtaining Self-Report of Affect in Marital Interaction

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Thirty married couples interacted in a low-conflict situation and a high-conflict situation during which continuous physiological measures were obtained. Each spouse returned separately for a second session in which they watched the videotape of the interaction and provided a continuous self-report rating of their own affect while the same physiological measures were again obtained. Observers coded the spouses' affect during each speech unit. The self-reports of affect (a) discriminated the high-conflict interaction from the low-conflict interaction, (b) correlated significantly with marital satisfaction, (c) were coherent between husband and wife, and (d) were significantly related to the observers' coding of the couples' affect. Physiological data obtained during the interaction session were significantly related (using time-series analyses) to physiological data obtained during the recall session.

In all comprehensive discussions of emotion the subject's own experience of affect has been considered an important channel of information (see Strongman, 1978). This channel has always been troublesome from an empirical standpoint in terms of meeting psychometric criteria of reliability and validity. One important application of a valid self-report procedure would be in the study of emotion during social interaction. Ekman, Friesen, and Ellsworth (1972) noted that the study of emotion in the context of social interaction can make a number of unique contributions. One of these contributions is the study of interaction as it unfolds in time, which permits the analysis of the sequential nature of the interaction using time-series analysis. Thus, a method for procuring the self-report of affect that could provide a continuous record over an interaction session would be extremely useful in the study of emotion in social interaction.

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We noted elsewhere (Levenson & Gottman, 1983) that marital interaction provides a rich corpus of affective moments and that the study of marriage has a long history that has produced several measures of marital satisfaction with good psychometric properties (for a review see Gottman, 1979). Unfortunately, there are a number of obstacles inherent in obtaining a self-report measure of affect during dyadic interaction. One approach is to stop the interaction at various points to obtain affect ratings. For example, Gottman et al. (1976) and Markman (1979, 1981) used a talk-table procedure that interrupts the interaction after each communication to obtain affect ratings from each participant. This procedure produces reasonably valid data that correlate with marital satisfaction and predict relationship satisfaction longitudinally, but it is extremely intrusive and cannot be employed to yield continuous data. In our work we have developed an alternative "video-recall" procedure in which subjects view videotape recordings of their interaction and use an affect rating dial, or joystick, to provide a continuous report of their feelings during the interaction. Although this procedure has the advantage of not interrupting the ongoing interaction, it raises a number of questions as to its validity, especially whether or not the affect ratings obtained while watching the videotape are accurate representations of how the subjects felt while in the

actual interaction. The purpose of this article is to provide evidence we have obtained that supports the validity of this video-recall procedure.

We hypothesized that any interaction that was high in emotional content would be more readily remembered and that subjects who viewed a videotape of a recent emotion-laden interaction would to some extent relive the emotional experience. To test this hypothesis we had to devise some operationalization of reliving; our choice was to do so in physiological terms. We hypothesized that a distinctive pattern of emotional arousal would produce the same pattern of physiological arousal (see Ekman, Levenson, & Friesen, 1983) regardless of whether the emotions were aroused in an interaction or while viewing a videotape of the interaction. Thus, isomorphism between physiological responses that occurred in the original interaction session and those that occurred during the video-recall session would provide some indication that the emotions (and associated cognitive processes) were reexperienced.

In this article we assessed the validity of our self-report of affect procedure: (a) by testing whether mean affect ratings are more negative for high-conflict interactions compared with low-conflict interactions, (b) by determining by correlation whether mean affect ratings are more negative for more dissatisfied couples, (c) by determining whether the affective self-reports obtained from the husband and wife are coherent with each other, (d) by determining if the affective self-reports are consistent with observers' objective coding of couples' affect, and (e) by assessing whether or not the recall procedure involved reliving the emotional experience, in the sense of coherence between interaction session and recall session physiological measures.

Method

Subjects

Married couples were recruited using two brief advertisements placed in the Bloomington, Indiana, newspaper. One was phrased, "couples needed for research project studying marriage" and the other asked for "couples having difficulty solving marital problems." A telephone screening was used to ensure that respondents spoke English as their native language, were able to meet the scheduling requirements of the study, and were willing to participate in a study that would involve discussion of marital problems in the laboratory while videotape, self-report, and physiological data were obtained. The first 30 acceptable couples formed the sample for the experiment and received $30 for their participation. The mean demographic characteristics of the participants were as follows: household income, $12,969; years married, 3.9; number of children, 1.0; husband's age, 27.5 years; husband's education, 14.8 years; wife's age, 26.0 years; and wife's education, 15.2 years.

Procedure

A complete description of the experimental methodology used to obtain these data is presented in Levenson and Gottman (1983). Briefly, the experiment consisted of three laboratory sessions. The first was scheduled for a time when the couple would not have spoken to each other for at least 8 hr. This session consisted of two 15-min conversations, each preceded by a 5-min preinteractional baseline, during which they sat in silence. In the first conversation, the couple was asked to discuss the events of the day as if they were home alone at the day's end. In the second conversation, they discussed a conflictive problem area in their marriage. Several days later, each spouse returned separately to view the videotape record of the interaction session and to provide affect ratings (the recall session).

Assessment

The couple's level of marital satisfaction was assessed by averaging the husband's and the wife's scores on two well-established inventories of marital satisfaction (Burgess, Locke, & Thomes, 1971; Locke & Wallace, 1959).

During the interaction session, four physiological measures were obtained from each spouse during the session's baselines and interactions: (a) heart rate, measured by the interbeat interval (IBI); (b) pulse transmission time to the finger (PTT), the time interval between the R wave on the electrocardiogram and the arrival of the pulse pressure wave at the finger tip; (c) skin conductance level (SCL); and (d) general somatic activity (ACT), a global measure of bodily movement. These four measures provided a reasonable breadth of measurement, reflecting the activity of four physiological systems (heart, vasculature, sweat glands, and muscles). In terms of underlying emotional processes, IBI, PTT, and SCL are all sensitive to sympathetic nervous system (SNS) activity. SNS activity has an evolutionary-based involvement with negative emotions, such as fear and anger, by virtue of its role in preparing the organism for the adaptations of fight and flight. A polygraph and digital computer were used to monitor these physiological variables continuously, averaging them every 10 s.

During the recall session, a continuous rating of affect was obtained by having the spouse manipulate a rating dial that traversed a 180° arc over a 9-point scale (anchored by *very negative* at 0° and *very positive* at 180°, with *neutral* at 90°). The positive–negative dimension was selected to keep the task manageable for the subjects and because this dimension has been shown to account for most of the variance in emotional judgments (e.g., Osgood, Suci, & Tannenbaum, 1957). Spouses were

given instructions for using the rating dial that emphasized that we wanted them to rate how they felt when they were actually in the interaction and not how they felt about watching themselves on videotape. They were told to adjust the dial position as often as necessary while viewing the videotape so that it always reflected their feelings during the interaction session. While the spouse viewed the videotape and provided the affect ratings, the same set of four physiological measures that were obtained in the interaction session were again obtained. The laboratory computer monitored the physiological variables as well as the dial position and calculated averages every 10 s.

Synchronization was maintained between the physiological data (in both sessions), the affect ratings, and the videotape recordings by establishing a common time zero. This was accomplished in the interaction session by having the computer start a video time-code generator by remote control at the same moment that it started timing the physiological and affective data. The time-code generator superimposed the elapsed time at the bottom of the videotape record. In the recall session, timing of the physiological and affective data was initiated by the computer's detection of a strip of reflective foil on the back of the videotape of the interaction session. This foil strip had been mounted at the exact point at which the video time code was started; thus, the same time zero was established for all data sets.

Processing the self-report of affect data. The affect dial ratings had been averaged into the same 10-s blocks used for forming the physiological time series. These data were further processed in three ways. First, overall averages of the raw-score dial ratings (1–9 scale) were computed by averaging the dial position over the ninety 10-s periods that composed each 15-min interaction for each subject. These data were used in correlational analyses with marital satisfaction levels for each spouse. Second, *z*-score time series were computed for each spouse during each interaction segment (events of the day and problem area) by transforming the 10-s raw-score time series (these *z* scores were computed using the mean and standard deviation for that spouse during that interaction segment). These *z*-score data were used in spectral time-series analyses to compute the extent of association (i.e., the coherence, explained later) between the husband's and wife's self-reports of affect. Third, each 10-s affect period was classified as being either positive (z score $\geq +1.5$), negative (z score ≤ -1.5), or neutral (all remaining periods). These categorical data were used to assess the agreement between observers' coding of the videotapes and the couple's affect ratings.

Observers' coding of the couples' affect. Observers were trained to use a specific affect-coding system (SPAFF) that categorized each speech unit as being neutral, positive, or negative. In the version of SPAFF used on these data, only the speaker's affect was coded. If classified as positive or negative, the speech unit was further classified into one of 11 specific affect codes (e.g., anger, disgust, or fear). Coders worked with the videotape records of the interaction and with a verbatim transcript that identified the speech units, using a unitization scheme described by Gottman (1979). For the purposes of this article, only the codes of positive, negative, or neutral were used. Because SPAFF has not yet been published, a brief description follows. SPAFF is a cultural informant coding system in that coders are selected who are thought to be skilled at judging emotions in this culture. The coding manual[1] provides guidelines for categorizing speech units based on consideration of a gestalt consisting of verbal content, voice tone, context, facial expression, gestures, and body movement. This coding is highly time consuming (it took two coders 2 years to complete the coding of the 30 couples in the present study), but we felt it crucial to provide an independent, objective basis for evaluating the validity of the couples' self-report rating of affect.

The observers' positive–negative categorical coding and the couples' positive–negative categorical ratings were used in analyses that determined the extent of agreement between the two data sources. There is one important structural difference between these two data sets that had to be dealt with. The observers' affect codes were based on speech units, whereas the couples' affect ratings were based on the average rating dial position during a 10-s period. Within each 10-s period there may be as many as six different speech units, thus complicating the determination of agreement. We decided to convert the coder's data into the proportion of negative affect in each 10-s period (i.e., the number of each spouse's speech units coded as negative in the period divided by total number of that spouse's speech units in the period) and into the proportion of positive affect in each 10-s period (i.e., the number of each spouse's speech units coded as positive in the period divided by the total number of that spouse's speech units in the period). We hypothesized that the proportion of speech units coded as negative by the observers would be higher in periods rated as negative by the spouse, compared to those rated as positive by the spouse. Similarly, we hypothesized that the proportion of speech units coded as positive by the observers would be higher in periods rated as positive by the spouse, compared to those rated as negative by the spouse.

Time-Series Analysis

For each couple (separately for the events of the day and problem area interactions), time-series analyses were performed on the 10-s-period affect-rating dial and physiological *z*-score data to determine (a) if the husband's affect ratings were consistent with the wife's and (b) if a spouse's physiological responses that occurred while viewing the videotape of the marital interaction were consistent with those that had occurred during the interaction (this was determined separately for each of the four physiological measures for each spouse). In each time-series analysis we determined whether the coherence between two time series was significant (e.g., between husband's and wife's affect-rating-dial data during events of the day and between husband's heart rate during events of the day interaction and husband's heart rate while watching the videotape of the events of the day interaction). The coherence is a measure of the degree of linear association between two time series.

Because time-series analyses may not be widely familiar,

[1] Copies of the coding manual may be obtained from John M. Gottman, Department of Psychology, University of Illinois, 603 E. Daniel Street, Champaign, Illinois 61820.

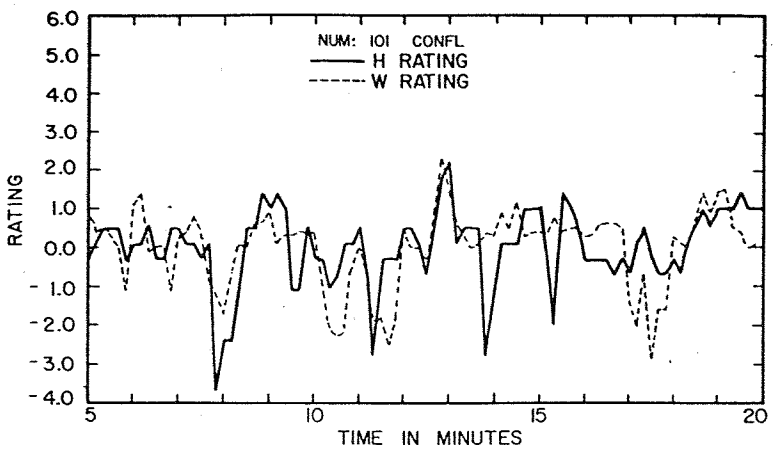

Figure 1. Time-series analysis of husband (H) and wife (W) affect-rating-dial data.

they are illustrated in Figures 1–3, which show, respectively, one couple's self-report of their own affect during the high-conflict discussion, the spectral density functions for each time series, and the coherence spectrum, which is statistically significant when it is above the line of pluses. These computations were made by the Gottman–Williams computer package (Williams & Gottman, 1981). We chose spectral time-series analysis over a time-series regression based on generalized least squares because the spectral technique considers all lags simultaneously. Spectral time-series analysis gives a statistic (whose statistical significance can be assessed; see Gottman, 1981; Williams & Gottman, 1981) for each frequency in the overtone series. In this article we assessed the relationship between two physiological time series (e.g., husband's heart rate during the interaction session and husband's heart rate during the recall session) conservatively by a yes–no decision: yes if the coherence was significant only in the frequency range of maximum variance for both series, no if it was not significant.

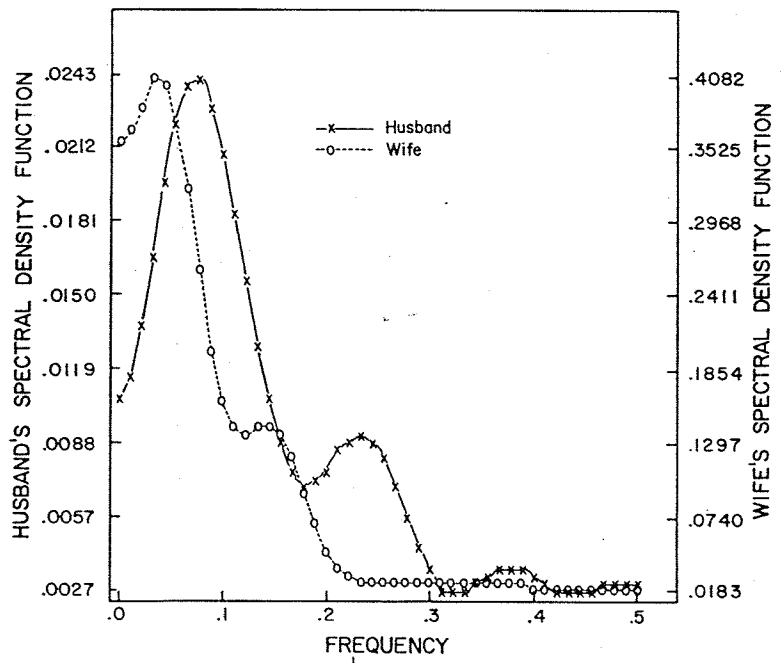

Figure 2. Spectral density functions of husband and wife time-series analysis.

We performed similar time-series analyses on affective data from the husband and wife and on physiological data from the interaction session and recall session. We report the number of analyses for which the coherence was significantly different from zero in the frequency range of maximum variance for both series. This is a stringent test of association because it requires that the two series be related in components of maximum variance for each series; otherwise, they are said to be unrelated. We then report the z score for the binomial sign test (Siegel, 1956), which determines if the number of couples showing significant coherence for a given measure was significantly greater than chance. We conservatively assumed as the null hypothesis that the probability was .5 of any test of the coherence being significant (i.e., significant coherences would be found in 15 couples by chance). We report the mean of the maximum coherence in the frequency range of maximum variance overlap for a variable to give some index of the strength of association. This coherence is analogous to a Pearson r^2. The following summarizes the time-series analyses: First, we identified the frequency range that contained the maximum variance for both time series. Second, we examined the coherence spectrum within this frequency band and noted if it was or was not significant. Third, if significant, we recorded the peak value of the coherence within this band; if not significant, we recorded a zero coherence. Fourth, we performed a binomial sign test across couples and also reported the mean coherence across couples.

Reliability

Reliabilities were determined by having two coders code a sample of approximately 15% of the speech units from each couple. Intercoder reliabilities for SPAFF codes were then computed using a stringent time-locked generalizability analysis of interobserver reliability that is appropriate for sequential analysis (for details, see Gottman, 1979). The reliabilities were quite high with Cronbach alphas of .94 for wife positive affect, .89 for wife negative affect, .99 for wife neutral affect, .96 for husband positive affect, .93 for husband negative affect, and .96 for husband neutral affect.

Results

Mean Affect Ratings: High Versus Low Conflict

For both spouses, the average of the affect-rating-dial data revealed significantly more negative affect during the high-conflict (problem area) discussion than during the low-conflict (events of the day) discussion. For wives the mean ratings were 3.90 for the problem area and 4.37 for the events of the day, $F(1, 29) = 22.86$, $p < .001$; for husbands

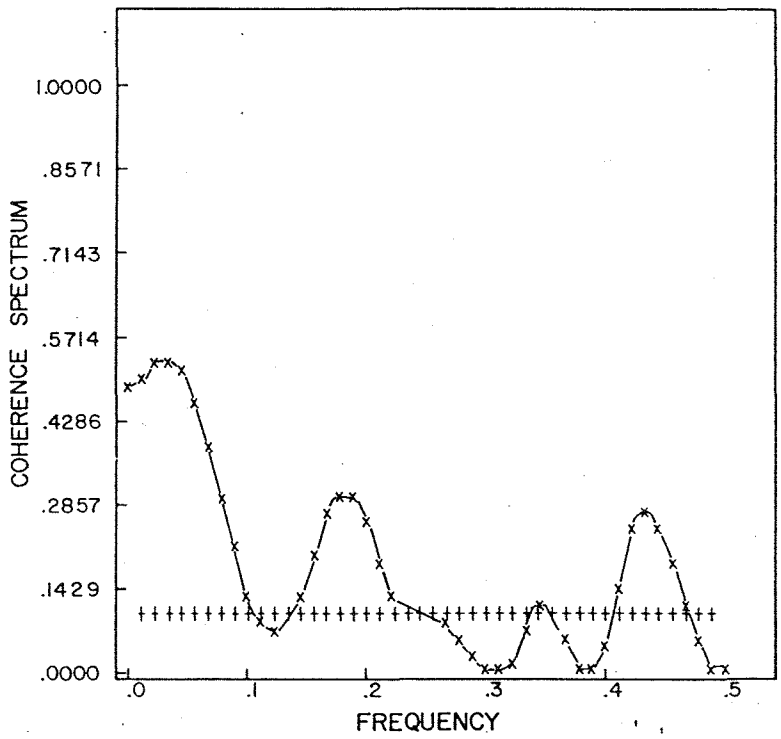

Figure 3. Coherence spectrum, examined only in the frequency range of maximum overlap.

the mean ratings were 3.63 for the problem area and 4.35 for the events of the day, $F(1, 29) = 32.95$, $p < .001$.

Mean Affect Ratings: Relationship With Marital Satisfaction

For both spouses during the problem area discussion, the more dissatisfied the couple was with their marriage, the more negative was the rating dial average: for wives, $r(28) = .50$, $p = .003$; for husbands, $r(28) = .32$, $p = .04$. During the events of the day discussion, the same directional relationship was found, but it was not significant: for wives, $r(28) = .30$, $p = .054$; for husbands, $r(28) = .15$, $p = .21$. In these analyses, the marital satisfaction scores were based on the couple's marital satisfaction (i.e., the average of both spouses' scores on the two marital satisfaction inventories). Using each spouse's satisfaction scores separately did not change the pattern of significant correlations.

Affect Ratings: Coherence of Husband's and Wife's Ratings

There was significant coherence between husband's and wife's affect ratings during the events of the day discussion in 26 of the 30 couples ($z = 4.02$, $p < .001$) and in 26 of the 30 couples during the problem area discussion ($z = 4.02$, $p < .001$). The averages (across couples) of the maximum coherence (analogous to a Pearson r^2) were .35 for the events of the day discussion and .38 for the problem area discussion.

Affect Ratings: Consistency With Observers' Objective Coding

We hypothesized that there would be agreement between spouses' affect dial ratings for each 10-s period and observers' objective coding of the speech units within those periods. We reasoned that a 10-s period rated negatively by a spouse could reflect that spouse's expression of negative affect (as indicated by that spouse's speech units being coded as negative by the observers) and/or a reaction to the other spouse's expression of negative affect (as indicated by the other spouse's speech units being coded as negative by the observers). Similar consistencies were expected for periods rated positively by spouses. Across all couples, taking 10-s periods rated negatively by husbands as an example, we would predict that these periods would be characterized by a greater proportion of the husband's speech units being coded as negative and of the wife's speech units being coded as negative, compared to 10-s periods rated positively by the husband. Repeated measures analyses of variance (ANOVAs) were used to test these hypothesis, and the results are presented in Table 1. Significant relations held in all instances (i.e., for both spouses and for both negative and positive affect). Thus, spouses' ratings of affect were found to be consistent with observers' coding, using this method for collating the two data sources.

These analyses were based on the rating dial z scores. A second set of analyses was

Table 1
Consistency Between Spouses' Affect Dial Ratings and Observers' Codings

Measure	Negative	Positive	$F(1, 29)$
Husband's rating of 10-s period			
Proportion of speech units coded as negative			
Husband's speech	.33	.11	41.94**
Wife's speech	.38	.14	28.46**
Proportion of speech units coded as positive			
Husband's speech	.32	.49	15.37**
Wife's speech	.34	.50	10.56*
Wife's rating of 10-s period			
Proportion of speech units coded as negative			
Wife's speech	.39	.12	20.91**
Husband's speech	.29	.10	21.35**
Proportion of speech units coded as positive			
Wife's speech	.26	.56	36.00**
Husband's speech	.35	.54	13.03*

* $p < .01$. ** $p < .001$.

Table 2
Coherence Between Physiological Data in Interaction Session and Recall Session

	Husband			Wife		
Measure	N	*z*	Coherence	N	*z*	Coherence
Events of day						
IBI	30	5.48**	.44	30	5.39**	.35
PTT	25	3.65**	.33	25	3.53**	.31
SCL	29	5.11**	.43	24[a]	3.93**	.40
ACT	28	4.58**	.30	26	4.15**	.32
Problem area						
IBI	30	5.48**	.39	26	3.90**	.34
PTT	29	5.02**	.32	25	3.53**	.31
SCL	27	4.38**	.44	25[a]	4.42**	.46
ACT	29	4.93**	.30	23	3.02*	.29

Note. N = number of couples with significant coherence; *z* = *z*-score value of binomial sign test; coherence is analogous to a Pearson r^2. IBI = interbeat interval (heart rate measurement); PTT = pulse transmission time to the finger; SCL = skin conductance level; ACT = general somatic activity (global measure of bodily movement).
[a] Based on only 27 subjects due to missing data.
* $p < .01$. ** $p < .001$.

performed that took into account both the rating dial *z* score and the raw score (i.e., the dial position on the 1–9 scale). Only marginal improvement in agreement between spouses' ratings and observers' coding was obtained using this double criterion.

Physiological Data: Coherence Between Interaction Session and Recall Session

Our hypothesis was that spouses would relive the experience physiologically when viewing the videotape of their interaction. Using analyses of the coherence of physiological time series for both spouses, this hypothesis was supported during both the events of the day and problem area discussions and for all four physiological measures. These results are presented in Table 2. It is important to note that the size of the relations between the interaction session and recall session physiological data suggests that couples' physiological behavior in the recall session closely parallels that of the interaction session. The average coherence across measures and spouses indicates that 36% of the variance is shared. Because the coherence statistic is invariant to linear transformations, relations other than simultaneity are possible (for example, lead–lag relations). In most cases, however, there was evidence for a simultaneous relation. To illustrate this point, we have selected representative graphs that visually illustrate instances in which the coherence measure was a meaningful index of the simultaneous association between two time series. Graphs of other couples showed a similar simultaneity relation. Examination of Figure 4 reveals that these subjects appear to sweat, change their heart rate, and change their pulse transmission times at nearly the same time points when viewing the videotape of the interaction as they did when they were in the original interaction. This is a striking phenomenon, and it must, in part, account for why the video-recall procedure produces such strong evidence of validity for the affect-rating-dial measure.

Discussion

This article reports the results of using a procedure for obtaining couples' self-reports of their own affect. The procedure results in data that have demonstrated validity: (a) mean ratings discriminated high-conflict interaction from low-conflict interaction; (b) mean ratings for a high-conflict interaction correlated with marital satisfaction scores; (c) husbands' ratings were coherent with their wives' ratings; (d) spouses' ratings of their own affect were highly related to observers' coding of spouses' affect; and (e) in the recall session, spouses relived the emotional experience in the sense

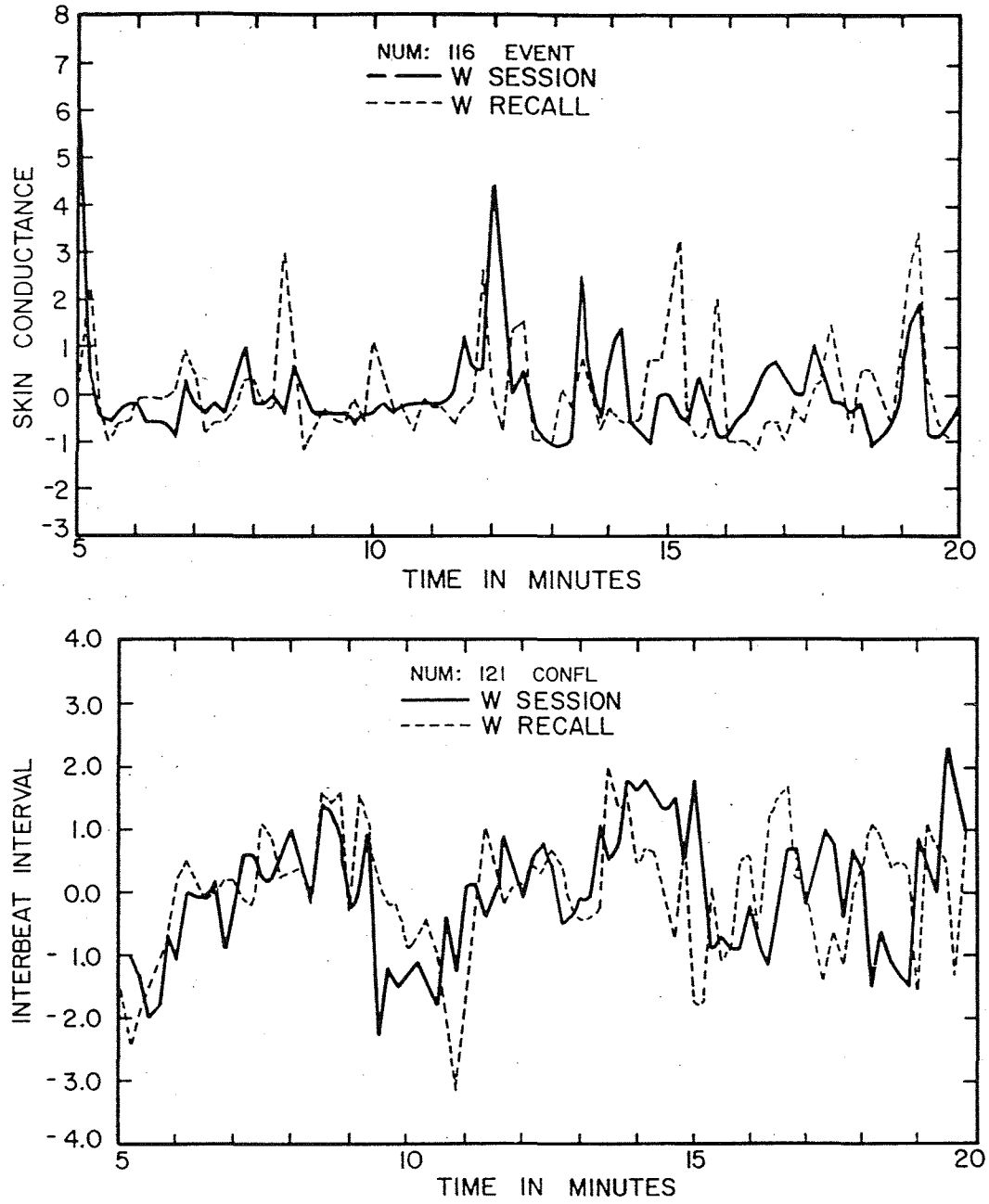

Figure 4. Comparison of interaction session and recall session physiological data illustrating the degree of simultaneity that is characteristic of high coherence in these data. (W = wife.)

of coherence between interaction session and recall session physiological measures.

This study is not the first to provide evidence for the validity of couples' self-reports of affect. Gottman et al.'s (1976) talk-table technique assessed the intent of the message sent (on a 5-point Likert scale) and the impact of the message received. Although intent ratings did not discriminate between happily and unhappily married couples, in

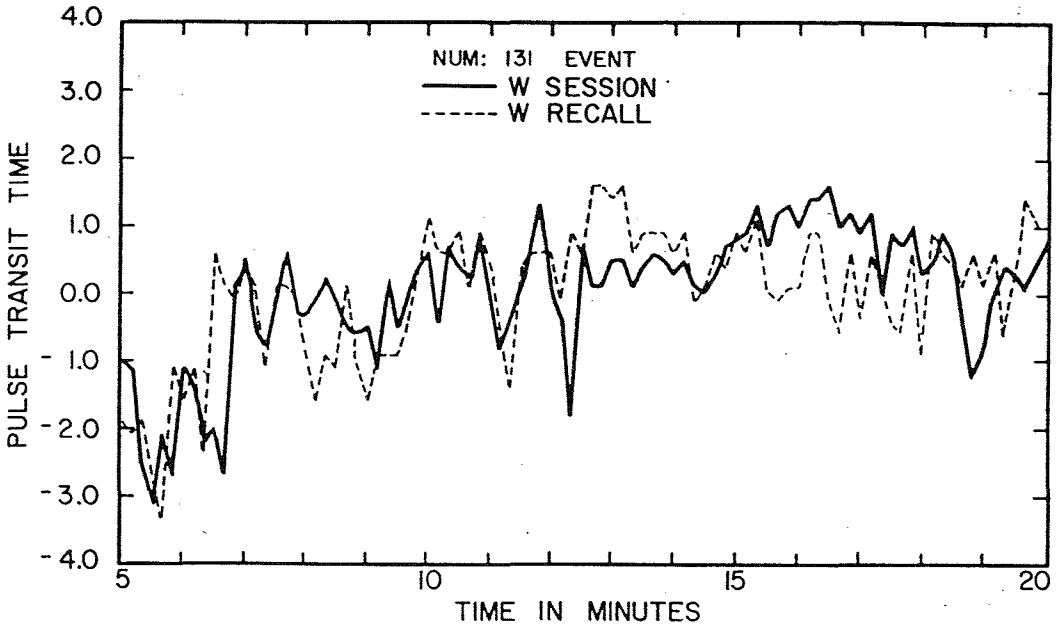

Figure 4. (Continued)

two studies the impact ratings did discriminate in high-conflict tasks. Using the same talk-table procedure, Markman (1979, 1981) found that he could predict the eventual relationship satisfaction of couples planning to marry. The predictions held over a 5-year period, and they remain some of the strongest predictions in this field.

It is important to discuss two studies that compared couples' coding with observers' coding and did not find a strong correspondence (Weiss, Wasserman, Wieder, & Summers, 1981; Margolin, Hatten, & Yost, in press). In both of these studies spouses were asked to code the positivity or negativity of their own behavior (and/or that of their partners). They were not asked to code their feelings. We suggest that when people are asked to do this task they may be coding the intent of their behavior, not its impact. Gottman et al. (1976) had explicitly made this distinction in their design of the talk-table procedure and found that only the impact rating correlated with marital satisfaction. We believe that asking couples to code their own behavior may require them to evaluate their behavior as good or bad, whereas asking couples to code their affect does not require a moral decision about one's own behavior.

Our findings support the validity of using the video-recall procedure and affect-rating dial to obtain a continuous measure of spouses' affect during marital interaction. In our use of the measure, strong indications of validity were found despite a delay of several days between the interaction session and the recall session; thus, we consider the procedure to be quite robust. We expect that the procedure will also be valid for other kinds of dyadic interaction besides marital interaction as long as the interaction produces a reasonable range of emotional responding. It is our hope that the strength of these findings will provide other researchers with sufficient confidence in these procedures to be able to adopt them when a continuous self-report of affect is needed. For those experimental paradigms that differ substantially from ours or in instances where the amplitude of emotional responding is suspect, we have provided two validational techniques—agreement with objective coders and physiological reliving—that could be utilized to validate our affective self-report procedures in other experimental contexts.

References

Burgess, E. W., Locke, H. J., & Thomes, M. M. (1971). *The family.* New York: Van Nostrand Reinhold.

Ekman, P., Friesen, W. V., & Ellsworth, P. (1972). *Emotion in the human face.* New York: Pergamon Press.

Ekman, P., Levenson, R. W., & Friesen, W. V. (1983). Autonomic activity distinguishes among emotions. *Science, 221,* 1208–1210.

Gottman, J. (1979). *Marital interaction: Experimental investigations.* New York: Academic Press.

Gottman, J. (1981). *Time-series analysis: A comprehensive introduction for social scientists.* New York: Cambridge University Press.

Gottman, J., Notarius, C., Markman, H., Bank, C., Yoppi, B., & Rubin, M. E. (1976). Behavior exchange theory and marital decision making. *Journal of Personality and Social Psychology, 34,* 14–23.

Levenson, R. W., & Gottman, J. M. (1983). Marital interaction: Physiological linkage and affective exchange. *Journal of Personality and Social Psychology, 45,* 587–597.

Locke, H. J., & Wallace, K. M. (1959). Short marital-adjustment and prediction tests: Their reliability and validity. *Marriage and Family Living, 21,* 251–255.

Margolin, G., Hatten, D., & Yost, K. (in press). Perceptual agreement between spouses and outside observers when coding themselves and a stranger dyad. *Behavioral Assessment.*

Markman, H. J. (1979). Application of a behavioral model of marriage in predicting relationship satisfaction of couples planning marriage. *Journal of Consulting and Clinical Psychology, 47,* 743–749.

Markman, H. J. (1981). Prediction of marital distress: A 5-year follow-up. *Journal of Consulting and Clinical Psychology, 49,* 760–762.

Osgood, C. E. G., Suci, G. J., & Tannenbaum, P. H. (1957). *The measurement of meaning.* Urbana: University of Illinois Press.

Siegel, S. (1956). *Nonparametric statistics for the behavioral sciences.* New York: McGraw-Hill.

Strongman, K. T. (1978). *The psychology of emotion.* Chichester, England: Wiley.

Weiss, R. L., Wasserman, D. A., Wieder, G. R., & Summers, K. (1981, December). *Subjective and objective evaluation of marital conflict: Couples vs. the establishment.* Paper presented at the 15th Annual Convention of the Association for the Advancement of Behavior Therapy, Toronto, Canada.

Williams, E., & Gottman, J. (1981). *A user's guide to the Gottman–Williams time-series programs for social scientists.* New York: Cambridge University Press.

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