The Topography of Marital Conflict: A Sequential Analysis of Verbal and Nonverbal Behavior*

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The present investigation studied couples' resolution of existing marital issues. Videotapes of distressed and nondistressed couples were coded by two groups of coders. One group categorized the content of messages, and the other group categorized the nonverbal delivery of messages by the speaker ("affect") and the nonverbal behaviors of the listener ("context"). An analysis of marital interaction was obtained from a study of content, affect, and context differences as well as from sequential analyses of the data. Findings show that this coding system made it possible to account for most of the variance in the classification of couples as distressed or nondistressed. Specific findings provided tests of many currently untested hypotheses about good communication in marriages that have been the basis of clinical interventions. The hypotheses which were studied in the present investigation involve the function of metacommunication, the expression of feelings, summarizing self versus other, feeling probes, nonverbal behavior during message delivery, context differences, and positive and negative reciprocity. Functions of messages were assessed by sequential analysis procedures.

Previous investigations which have intended to describe how distressed and nondistressed couples resolve marital conflict have suffered from several major methodological problems. The present investigation has both methodological and theoretical aspects, and this paper will argue that these two aspects of research on couples' interaction are intricately connected; that is, that theoretical development has suffered from the lack of careful attention to methodology and that methodology has suffered from the lack of attention to theory.

One methodological problem is the hidden assumption that the nature of the task is unimportant, and that there is essentially no inferential leap from describing couples' interaction on a structured task to knowing how couples would resolve a real marital issue. The tasks used to study couples and family interaction have ranged from creating TAT stories (Haley, 1964, 1967) to a standard inventory in which husband and wife are given two sides of a series of vignettes and must decide who is most at fault (Olson and Ryder, 1970). There is also some evidence

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that the nature of the task makes a difference in the extent to which it is possible to discriminate distressed from nondistressed couples (Gottman *et al.*, 1976). The present investigation attempted to avoid an inferential leap by having couples resolve an existing salient marital issue rather than interact on a structured laboratory task.

A second problem with previous research is the way in which interaction data are coded. Previous coding systems may be confusing the description of a message with its function in the stream of exchange. For example, suppose a husband says, "Let's spend Christmas at your mother's," and the wife responds, "You always get tense at my mother's." Most coding systems would categorize the wife's statement as a disagreement since it *functions* not to support the husband's proposal of how to spend the vacation. However, the wife's statement may be a different message depending upon how it is delivered nonverbally. This point has important theoretical implications. The present investigation distinguished among three components of a message: the printed word content ("content"); the nonverbal delivery of the message ("affect"); and the nonverbal behaviors of the listener ("context"). It should be noted that this is a novel definition of context, and represents one attempt to operationalize a concept that has often been discussed as central to understanding the meaning of messages. In the study presented in this paper, two groups of coders independently coded the content aspect of message delivery or the nonverbal behaviors in message delivery and message reception. The theoretical assumption which underlies this coding system, first articulated by Reusch and Bateson (1951) and then by Watzlawick *et al.* (1960), is that a message's function will vary depending on either affect or context as well as content. The separate coding of verbal and nonverbal behavior may make it possible to describe the *function* of a message in terms of the response it elicits, depending on how it is delivered and in what context the delivery occurs.

A third problem with previous research concerns the descriptive utility of the codes. Some systems lump codes into two categories, positive or negative (Birchler *et al.*, 1975). While these global summary codes have some general utility in discriminating distressed from nondistressed couples, the summary codes are not useful in describing precisely what nondistressed couples do differently than distressed couples. They are therefore not very useful in designing intervention programs for distressed marriages. Other category systems that have attempted to provide more precise description have unfortunately been forced to lump disparate codes in order to obtain respectable reliabilities between coders. For example, Raush *et al.* (1974) combined codes such as "seeking information," "withholding information," "raising an issue," "agreement," and "disagreement" into a code they called "cognitive" to increase reliabilities. In this lumping scheme a great deal of valuable descriptive information is lost. The present investigation used a coding system which we developed that employed discrete conceptual codes. This coding system makes it possible to improve our ability to *describe* marital interaction and to "map" the conflict resolution behavior of couples.

It is important to note that measures of reliability vary as a function of the kind of analysis that one proposes to do. If relative frequencies of codes are the major dependent variables, then it is possible to sum codes over blocks of transcript and to calculate reliability as intercoder correlation. High correlations can be obtained in this case even when coders disagree on specific transcript units (for example, see Alexander, 1973). If, however, the analysis is sequential, reliability must be calculated as intercoder agreement *tied to specific units of the transcript*. This is a far more stringent reliability criterion, and thus the stringency of the reliability measure depends on the kind of statement (sequential or nonsequential) that the researcher wishes to make. The present investigation used this stringent reliability criterion.

A fourth problem with previous research concerns the manner in which data have been analyzed. This problem involves three issues. One concerns the fact that relative frequencies of coding categories form a dependent set of correlated variables, and it would therefore be wise to perform multivariate rather than univariate analyses of variance. A second issue is the nonsequential nature of most data analyses on couples and family interaction. Raush *et al.* (1974), using Markov matrix techniques, make a pioneering attempt to use

data analytic techniques that view the marriage as a *system*. The systemic picture is obtained by the use of transition probabilities, now a common technique in some fields studying dyadic interaction (for example, see Hutt and Hutt, 1970 and Lewis and Rosenblum, 1975). However, Raush *et al.* (1974) assume that a first-order Markov model is adequate, and therefore their sequential analyses do not look at sequential dependencies beyond a first-order lag. Analyses of the data using longer lags may reveal sequences not described by a first-order analysis.

At the heart of this paper's criticisms of previous research is the contention that the role of *description*, an important phase of scientific investigation, has been minimized. Without careful, detailed description, theorizing about marital interaction is likely to be premature and to generate controversies that produce more heat than light.

One theoretical issue related to the study of the marital dyad as an interacting system and how data are analyzed concerns the concept of reciprocity. Reciprocity of positive exchange has been repeatedly implicated as the single most important description of good marriages in the clinical literature (Azrin *et al.*, 1973; Lederer and Jackson, 1968; Rappaport and Harrell, 1972; Stuart, 1969; Weiss *et al.*, 1975). It is important to point out that the high base rates of positive codes for both husband and wife are not equivalent to reciprocity. Although nondistressed couples may seem to be reciprocating positive codes more frequently than distressed couples, this result may only be an artifact of the higher probability of positive codes in nondistressed couples. What needs to be demonstrated is that significant reduction in uncertainty is gained about a particular consequent code in a sequence by knowledge of a particular antecedent code. For example, the conditional probability of a consequent positive wife code, W+, given an antecedent positive husband code, H+, must be significantly greater than the nonconditional probability of occurrence of W+. This means that a knowledge of the antecedent code, H+, adds significantly to the ability to predict the occurrence of a W+ code over and above prediction from simply knowing the relative frequency of occurrence of W+. Symbolically, what must be demonstrated in this example is that $p\,(W+/H+) > p\,(W+)$. It may be less likely that a high probable code will increase than a less probable code will increase. An analysis of covariance, with unconditional probability as the covariate, would control for possible ceiling effects. This type of analysis has never been undertaken in previous studies on couples' interaction.

The distinction between high rates of positive codes and reciprocity has been ignored in the clinical literature on family interaction. For example, Alexander (1973) found that the correlation across families between parent-to-child supportive behavior and child-to-parent supportive behavior was significantly different from zero (father/son $r = .69$, $p < .05$; mother/son $r = .59$, $p < .05$). These correlations do not imply temporal reciprocity. A family with high rates of supportiveness could be distributing these behaviors noncontingently throughout a discussion. In this case, the correlations obtained would be high as a function of different base rates across families, but there would still be no evidence of temporal reciprocity. The use of the term "reciprocity" without reference to contingent exchange is common in the literature. For example, Patterson *et al.* (1975:301) discussed "reciprocity" on the basis of rank-order correlations between husbands and wives.

The base-rate/reciprocity issue is also important for distinguishing between behavior exchange and social learning theories of distressed versus nondistressed marital conflict resolution. Birchler *et al.* (1975) used a mix of language from both theories. They demonstrated that distressed couples emit lower rates of positive codes and higher rates of negative codes than nondistressed couples do. This does not justify calling the positive codes "social reinforcements." It would be necessary to show that a particular antecedent code on the part of one spouse affects the probability of occurrence of a particular consequent code on the part of the other spouse. In line with the discussion above, the present investigation will perform reciprocity analyses in which unconditional probability is used as a covariate for conditional probability.

There are a number of other hypotheses concerning what characterizes marital interaction in nondistressed marriages that have assumed the status of clinical folklore. One

set of hypotheses concerns the role of metacommunication statements, that is, communication about the process of communication. Some writers (for example, Watzlawick *et al.*, 1968) have argued that metacommunicative acts are symptomatic of a status struggle between "symmetry" and "complimentarity" and thus are pathological, while many therapy programs have suggested that metacommunicative acts indicate an awareness of communicative process. These therapy programs have the goal of increasing a couple's or a family's ability to comment on the process of communication. There are other examples. The direct expression of feeling is usually assumed to be characteristic of good relationships. More statements summarizing the other's messages compared to summarizing or repeating one's own messages are presumed to be indicative of good listening. "Mindreading," or attributing thoughts, feelings or motives to the other person rather than asking about feelings directly is usually presumed to be characteristic of poor communication. It is difficult to reference these hypotheses, although they are assumptions characteristic of most communication-oriented therapy programs for couples (see, for example, the April, 1975 issue of *The Family Coordinator*). The present investigation included content codes designed to explicitly test some of these hypotheses.

A final methodological problem of previous investigations is the way in which marital distress is defined. The present investigation follows a recommendation of Gottman *et al.* (1976) to use a *convergence* of two operational definitions of marital distress; namely, self-report measures of marital satisfaction (Burgess *et al.*, 1971), and the clinic/nonclinic distinction (Navran, 1967). "Distressed" couples are couples seeking marital counseling, at least one of whom is below cutoff scores on the Locke-Wallace inventory; "nondistressed" couples have responded to an advertisement which required them to identify their marriage as a good one in which both spouses score above cutoff scores on the Locke-Wallace inventory.

METHOD

Subjects

The subjects were two groups of 14 married couples. Fourteen couples were referred to the study by marital counseling agencies or responded to an advertisement asking for research subjects who felt their marriage to be unsatisfactory. They will be referred to as "clinic" couples in this paper. Fourteen couples responded to an advertisement asking for couples who felt their marriage was "mutually satisfying." They will be referred to as "nonclinic" couples in this paper. All 28 couples took the Locke-Wallace Marital Relationship Inventory (MRI). To implement the convergent criteria discussed above, the five clinic couples with the lowest MRI scores and the five nonclinic couples with the highest MRI scores were selected for analysis. The five couples in the distressed group had average MRI scores of 69.30 with a standard deviation of 3.44; the five couples in the nondistressed group had average MRI scores of 108.50 with a standard deviation of 1.46, $t\,(8) = 23.46$, $p < .001$. There were no differences between the two groups of couples for husband's age, $t\,(8) = .17$, n.s., with nondistressed husbands averaging 25.8 years and distressed husbands averaging 26.8 years; for wife's age, $t\,(8) = .36$, n.s., with nondistressed wives averaging 24.6 years and distressed wives averaging 23.6 years; or for number of years married, $t\,(8) = .36$, n.s., with nondistressed couples married an average of 3.55 years and distressed couples an average of 3.48 years. Couples in the present investigation were included in a larger study, part of which has been reported in Gottman *et al.* (1976).

Procedure

All couples filled out a problem inventory requiring husband and wife individually to rate the perceived severity of a set of marital problems. After an interview which focused on salient problem areas, the couple was asked to discuss one problem and come to a mutually satisfactory resolution of the issue. Their discussion was videotaped.

Videotapes were first transcribed verbatim. Two sets of coders were then trained, 10 on a set of content codes, and four others on a set of nonverbal codes. Random spot reliability checks on both groups of coders were made by periodically having all coders unknowingly code the same videotape. A majority of the 10 content coders (six out of 10) agreed an average of 88.7 percent of the time on three

random spot reliability checks. This procedure of random spot checking reliability was used to control for problems of reliability decay and drift. These techniques of reliability checking are consistent with recent methodological studies (Lipinski and Nelson, 1974).

Reliability of the nonverbal codes was consistently above 80 percent for pairs of coders and averaged 85 percent. All coders were blind to the couples' classification as distressed or nondistressed, and were unaware when they were coding a reliability tape.

Content codes. The following eight summary codes of the Couples Interaction Scoring System (CISS) are used to code the content of messages. This coding system is described in detail in a coding manual for training observers that is available from the first author. The codes are: (1) problem information or feelings about a problem (PF) (*e.g.*, "The problem is we don't have enough money," or "That makes me sad"); (2) mindreading—attributing thoughts, feelings, motives, attitudes, or actions to spouse (MR) (*e.g.*, "You always get mad in those situations"); (3) proposing a solution (PS) (*e.g.*, "Let's take out a loan"); (4) communication talk (CT) (*e.g.*, "We're getting off the issue"); (5) agreement (AG) (*e.g.*, "Yeah, you're right"); (6) disagreement (DG) (*e.g.*, "No," "Yes, but . . . ," "No, because it's too late"); (7) summarizing other (SO) (*e.g.*, "What you're saying is I drink too much," and "We're both suggesting a vacation"); and (8) summarizing self (SS) (*e.g.*, "I told you I'm not going").

Affect codes. The same codes are used to describe listener and speaker nonverbal behavior. Following the work of Mehrabin (1972), a hierarchy of cues was defined as a decision rule for coding affect as positive, negative, or neutral, using the manual, part of which is summarized below:

(1) *Face*—positive facial cues include smile, empathic face, head nod, eye contact. Negative facial cues include frown, sneer, fear, cry, angry face, and disgust.
(2) *Voice*—positive voice cues include voice tones that sound warm, tender, affectionate, cheerful, or happy. Negative voice cues include voice tones that sound cold, tense, fearful, impatient, whining, sarcastic, blaming, angry, hurt, mocking, or depressed.
(3) *Body*—positive body cues include touching, relaxation, and forward lean. Negative body cues include arms akimbo, neck or hand tension, inattention, and point, jab, or slice with hand.

First the coder scanned specific facial cues. If there were no positive or negative facial cues, the coder scanned specific voice tone cues. If there were no positive or negative voice tone cues, the coder scanned body position and movement cues. If there were still no positive or negative cues, the unit was coded neutral.

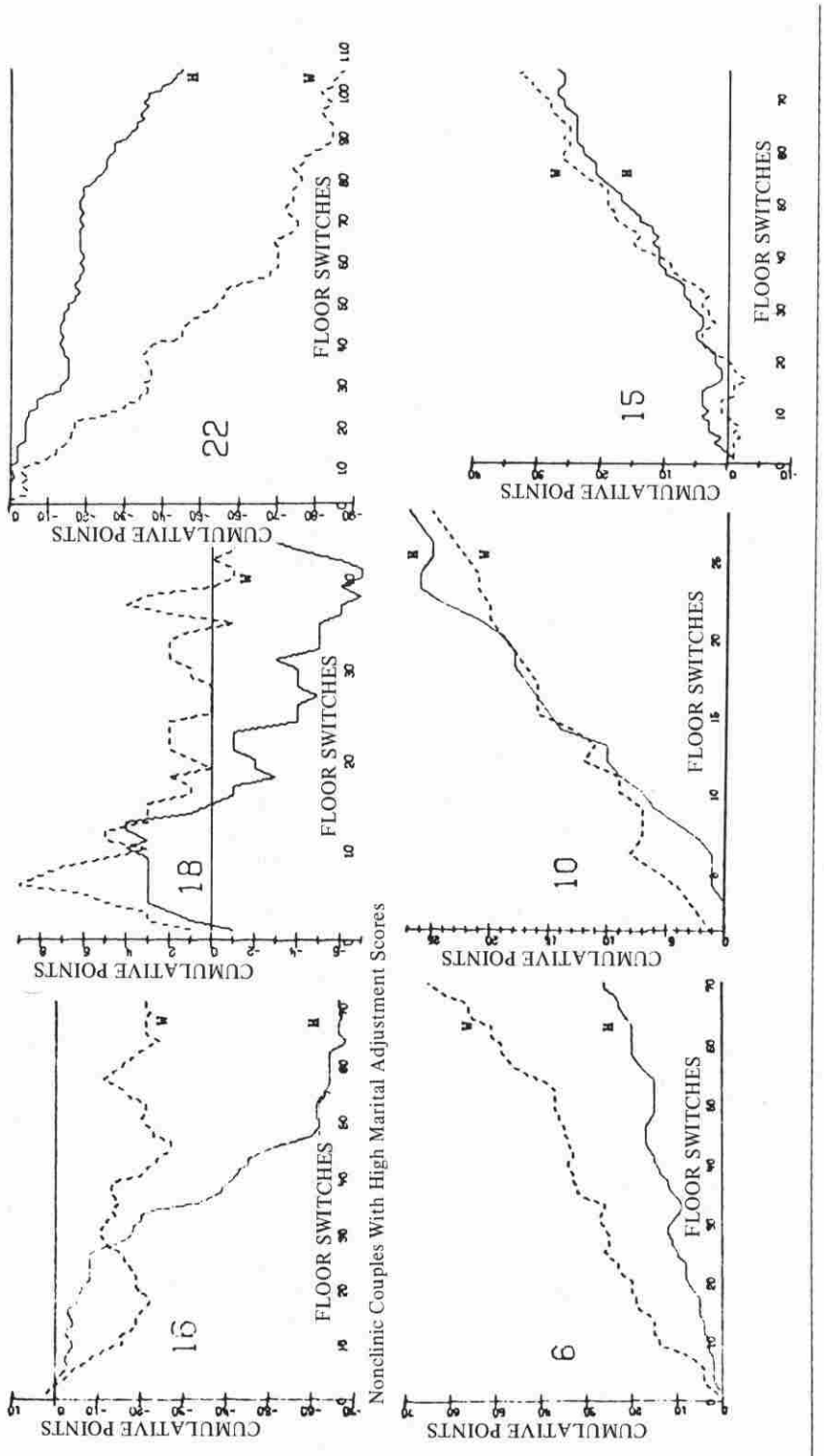
The coding procedure used in the present investigation is an expensive procedure. The total time for verbatim transcribing, content and affect coding was approximately 28 hours per hour of videotape.

The unit of data analysis for both the nonsequential and the sequential analyses was similar to the one proposed by Weiss *et al.* (1973) in which two adjoining transcript segments (called "thought units") that receive the same code are considered part of the same "behavior unit." The present investigation differed from the Weiss *et al.* study in that it defined a new behavior unit when there was a change in either content, speaker affect, or listener affect. This means, for example, that the same message delivered with the same nonverbal behavior was not considered the same if the listener's nonverbal behavior (context) changed.

RESULTS AND DISCUSSION

The presentation of the results will be divided into five parts. The first part will present the general unidimensional pattern of the results individually by couples using a graphical analysis. The second part will present multivariate analyses of specific content codes paired with affect codes. The third part will present analyses of outcome variables that have been used in previous literature to discriminate distressed from nondistressed families and also variables analogous to those that have been used to test out specific clinical hypotheses about good communication in marriage. The fourth part will present the sequential analyses for all 28 couples in the sample in two parts. First, probable content-by-affect sequences will be identified separately for clinic and nonclinic

FIGURE 1. UNIDIMENSIONAL SCALING OF POSITIVE AND NEGATIVE BEHAVIOR DURING DISCUSSION OF A MARITAL ISSUE



couples. Second, analyses are presented to test reciprocity of affect as a discriminator between clinic and nonclinic couples. The fifth part will present analyses of context differences between clinic and nonclinic couples; *i.e.*, the nonverbal behaviors of the listener and the ability of these behaviors to predict that person's immediately consequent speaker nonverbal behaviors.

Overall Unidimensional Scaling—Graphical Patterns

To summarize the results graphically, the floor switch (floor switching from one spouse to the other) was used as the unit of analysis. A cumulative plot was drawn of the sum of positive and negative codes using the following point system: (1) each positive listener or speaker affect code = +1; (2) each negative listener or speaker affect code = -1; (3) mindreading with negative affect = -2, mindreading with positive affect = +2; (4) problem solving = +1 only if followed by an agreement by the spouse in the next floor switch; (5) agreement = +1, disagreement = -1. With the floor switch as a unit, a husband may speak for a series of transcript units, earning positive or negative points for content and for speaker nonverbal behaviors. He can also earn positive or negative points as a listener when his wife has the floor. The total points earned are plotted for husband and for wife for each floor switch. Zero is the neutral point.

This point system represents our collective clinical intuition concerning how the codes can be scaled on a univariate dimension of the impact of messages on the communication process. Figure 1 presents examples of these point system graphs. Generally, the graphs of distressed couples show an absence of the positive trend evident in the graphs of the nondistressed couples. The graphs provide a visual "topographic" summary of the interaction that has discriminative power in distinguishing distressed from nondistressed marital interaction. We would like to comment on the clinical utility of the point graphs. It is our experience that the graphs go along with our clinical reactions to the videotapes. For example, in watching the tape of one couple, we sensed a distinct shift in the interaction at roughly the same point at which the cumulative point graph changed slope. Although this is not surprising, since we constructed the point system to fit our intuitions about communication in couples, it does represent a face valid, albeit anecdotal, check. The graphs may, in fact, be used to generate a taxonomy of couples on the basis of their interactional style. We are beginning to find distressed couples whose point graphs show cycles of positive and negative points much like a sine wave. The cross-spectrum of these cycles may describe linkages between nonverbal and verbal systems between husband and wife. This analysis on a large sample of 50 couples is underway in our laboratory.

Relative Frequencies of Specific Codes

Since the analyses were performed on proportional data, all variables were transformed according to proper statistical convention for proportional data using an arcsine square root transformation (Myers, 1966). Three multivariate analyses of variance were performed: one analysis on the eight content codes with neutral speaker affect; one with the eight content codes with positive speaker affect; and one with the eight summary codes with negative speaker affect. The design was 2 x 2 with distressed/nondistressed as the between subjects factor and husband/wife as the within subjects factor. There was not a significant main effect for the husband/wife factor for the neutral codes, multivariate F-ratio with Wilks Lambda criterion, F (8, 9) = 2.66, $p > .05$; for the positive codes, F (8, 9) = 2.68, $p > .05$; or for the negative codes, F (8, 9) = 2.54, $p > .05$. There also was not a significant husband/wife by distress interaction: for the neutral codes, F (8, 9) = .52, $p > .05$; for the positive codes, F (8, 9) = .72, $p > .05$; and for the negative codes F (8, 9) = 1.44, $p > .05$. There was, however, a significant distress main effect for the neutral codes, F (8, 9) = 3.71, $p < .05$, and for the negative codes, F (8, 9) = 4.36, $p < .05$. There was not a significant multivariate distress main effect for the positive codes, F (8, 9) = 1.18, $p > .05$. Table 1 presents the univariate and multivariate F-ratios for the neutral and negative distress main effect. Distressed couples were less likely to express agreement with accompanying neutral nonverbal behaviors and more likely to express agreement with accompanying negative nonverbal be-

TABLE 1. CONTENT-BY-AFFECT CODES UNIVARIATE AND MULTIVARIATE ANALYSES OF VARIANCE (MEANS IN PERCENTAGES)

Code	Univariate F-ratio[a]	Distressed Mean	Nondistressed Mean	Multiple R
Neutral Affect				
Prob Feeling (PF)	4.03	30.29	38.79	
Mindreading (MR)	.00	7.07	8.18	
Prob Solving (PS)	1.88	8.68	5.82	
Comm Talk (CT)	.24	4.03	3.91	
Agreement (AG)	9.65**	8.36	19.83	
Disagreement (DG)	1.98	6.21	8.29	
Summarize Other (SO)	.49	.22	.56	
Summarize Self (SS)	1.34	.61	.09	$R = .88$
Negative Affect				
Prob Feeling (PF)	36.06***	11.88	1.10	
Mindreading (MR)	27.85***	5.07	.19	
Prob Solving (PS)	3.25	1.25	.19	
Comm Talk (CT)	.12	.28	.77	
Agreement (AG)	8.23*	.36	.00	
Disagreement (DG)	14.05**	5.27	.48	
Summarize Other (SO)	1.00	.15	.00	
Summarize Self (SS)	1.00	.06	.00	$R = .89$

*$p < .05$.
**$p < .01$.
***$p < .001$.
[a]F-ratios computed on arcsine $\sqrt{x}$ transformation customary for proportional data.

haviors than were their nondistressed counterparts. Agreement delivered by a speaker with negative nonverbal behavior may be one example of channel inconsistency in message transmission. Distressed couples were more likely to express their feelings about a problem, to mindread, and to disagree, all with negative nonverbal behaviors. The size of the univariate F-ratios is particularly striking, especially in this literature, and the *omega*-square for expressing feelings about a problem (PF-) is .778, which suggests that these coding variables are able to account for most of the variance in the classification of couples as distressed or nondistressed.

There are also important negative results in these analyses. Distressed and nondistressed couples did not differ on the relative frequency of metacommunicative statements or on the relative frequency of feeling statements made independent of affect. The two groups of couples also did not differ on the relative frequency of mindreading statements, although here again the nonverbal mode of delivery strongly discriminated the two groups. In fact, when content codes were summed over the three affect codes, the only significant difference was for agreement for the wives, $F\ (1, 8) = 23.89$, $p < .01$, with distressed wives averaging 5.93 percent and nondistressed wives averaging 25.76 percent. Consideration of the nonverbal mode of delivery of feeling statements therefore adds a great deal of discriminative power.

Specific Outcome Variables

Riskin and Faunce (1972) concluded that the most consistent discriminator across studies between distressed and nondistressed families was the ratio of agreement to disagreement. They suggested this variable as one which can be used to assess the outcome of family therapy. We calculated the proportion of agreements to agreements-plus-disagreements for our data. This ratio avoids dividing by zero if there were no disagreements in a transcript. For husbands, we found that $t\ (8) = 2.07$, $p < .05$ with distressed husbands averaging .46 and nondistressed husbands averaging .66. For wives, we found that $t\ (8) = 7.78$, $p < .0001$, with distressed wives averaging .39 and nondistressed wives averaging .76. This index of agreement to agreement-plus-disagreement might therefore be a good outcome measure for discriminating couples along a distress dimension.

Since most coding systems confound agreement with positive nonverbal behaviors when speaking, and disagreement with negative nonverbal behaviors when speaking (for example, see Birchler *et al.*, 1975), we calculated positive, neutral, and negative

affect summed over all content codes. A multivariate analysis of variance on the proportion of the three affect codes after arcsine square root transformation found no interaction effect of the husband/wife by the distress factor, with multivariate F (3, 14) = .72, $p > .05$, nonsignificant husband/wife main effect, F (3, 14) = 3.11, $p > .05$, and significant distress main effect, F (3, 14) = 12.44, $p < .001$. Neutral affect contributed to the affect multivariate effect, $F = 11.67$, df = (3, 14), $p < .01$, with a distressed couple's mean of .65 and a nondistressed couple's mean of .85. Negative affect also contributed to the affect multivariate effect, $F = 35.36$, df = (3, 14), $p < .001$, with a distressed couple's mean of .25 and a nondistressed couple's mean of .03. The F-ratio for positive affect was not significant. Thus, both neutral and negative affect contributed to the multivariate effect, but positive affect did not. These analyses indicate that agreement to disagreement ratios and nonverbal behavior during message delivery both independently discriminate distressed from nondistressed couples, although the F-ratios are larger for nonverbal behavior. *Nonverbal behavior thus discriminated distressed from nondistressed couples better than verbal behavior.*

The findings concerning negative and positive nonverbal behavior are in contrast to the Birchler *et al.* (1975) study which found that both negative and positive codes discriminate between distressed and nondistressed couples. We obtain these results on positive *content* codes such as agreement, but when we analyze strictly the nonverbal behaviors of message delivery, positive nonverbal codes do not discriminate distressed from nondistressed couples. Birchler *et al.* (1975) confounded both content and nonverbal cues in their summary positive and negative codes. Greater descriptive information is thus obtained by teasing out nonverbal from verbal aspects of message exchange.

To assess whether distressed couples are more likely than nondistressed couples to summarize themselves than their spouses, an index of "listening" to their partner, we calculated the proportion of summary statements that were summarizing self. For husbands, we found that t (8) = 1.92, $p < .05$, with distressed husbands averaging .60 and nondistressed husbands averaging .10. For wives, we found that t (8) = 2.11, $p < .05$, with distressed wives averaging .40 and nondistressed wives averaging .00. Therefore, the ratio of summarizing self to total summary statements discriminates distressed from nondistressed couples and lends support to the conclusion that distressed couples' communication is more likely to be characterized by a "summarizing self" syndrome, rather than summarizing the spouse or summarizing both positions.

Sequential Analyses

Detailed sequential analysis requires long chains of interaction and if the analysis is to go beyond first-order sequences, data from more than the 10 couples discussed above must be included to have adequate confidence in estimates of conditional probabilities. Therefore, for the sequential analyses, the data for all 28 couples in the sample—that is, all 14 clinic couples and all 14 nonclinic couples—were included.

Analyses were performed using a method called *lag sequential analysis* which was devised by Sackett (1974). In this analysis, a behavior code is selected as the criterion and transition probabilities of all the other codes are calculated with respect to the criterion code as a function of lag from the criterion. Each behavior code of interest is then made the criterion. Confidence intervals are computed using statistics on the distribution of proportions about unconditional expected values (see, Bakeman and Dabbs, 1976).

Sequences are identified in three steps. First, for example, suppose the code with the highest lag-one conditional probability from the criterion behavior "A" is code "B," the code with the highest lag-two conditional probability from the criterion is behavior "C," and so on. A probable sequence A → B → C then is identified. The second step in identifying a sequence is to note that this would be a likely sequence only if the lag-one transitional probability of behavior "C" with behavior "B" as the criterion showed a peak. The third step in identifying a probable sequence is to determine, at any lag, the Z-scores of the codes with highest conditional probabilities. Thus, if a code is the most probable code at some lag from the criterion, but no more probable than at any other time, it does not enter into the identified *sequence*. In summary, the three

steps in identifying a probable sequence are:

(1) Select a criterion behavior code, C, and compute the conditional probabilities of the other codes at each lag. If behavior code A has the highest conditional probability with respect to C at lag one, and B has the highest conditional probability with respect to C at lag two, a possible sequence $C \rightarrow A \rightarrow B$ is suggested.
(2) To test the sequence $C \rightarrow A \rightarrow B$, make A the criterion behavior and see if the transition probability of B with respect to A at lag one from A shows a peak (*i.e.*, is above the transition probabilities of other codes).
(3) Z-scores which test conditional against unconditional probabilities should be greater than 1.96, or the transition probabilities are at base rate level, which would argue against a *sequence* (*i.e.*, some reduction in uncertainty in a code, given knowledge that the criterion has occurred at some prior lag).

To simplify the presentation of results, only codes whose transitional probabilities at some lag exceeded .07 were presented. Analyses were performed using a computer program written by Roger Bakeman.

The lag sequential analysis used with the three steps described above will extract all the information of an Nth order Markov analysis. The order of the sequence is the lag beyond which the conditional probabilities of codes are not different (using Z-scores) from unconditional probabilities. The mathematics of the analysis is presented in Bakeman and Dabbs (1976), Gottman and Notarius (in press) and Sackett (1974).

The sequential analyses will be presented in two parts. First, we will track the probable sequences of a clinic or a nonclinic discussion of a marital issue. Second, we will present the sequences of speaker nonverbal behavior; these latter results will include analyses addressed to the issue of reciprocity.

Probable Sequences of the Discussion

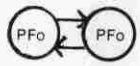
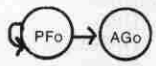
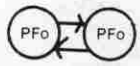
Table 2 presents the sequential analyses. Most discussions begin with a description of feelings or information about a problem with neutral affect (PFo). The table contains two parts, one with the husband's description of feelings or information about a problem with neutral affect (HPFo) as the criterion behavior and one with the wife's (WPFo) as the criterion. On the right of each set of conditional probabilities a state transition diagram summarizes the most probable sequence for each group. For example, for nonclinic couples, with HPFo as the criterion, at lag one we see the wife agreement with neutral affect (WAGo) is the most likely code, and that the Z-score for that code is 9.77, which indicates that it is far more likely to occur at lag one following HPFo than its unconditional probability would lead us to predict.

Table 2 can be summarized by the state transition diagrams. Nonclinic couples are likely to respond to information or an expression of feeling about a problem with agreement delivered with neutral affect, and they keep cycling through agreement. This loop is called "validation" in Table 2. Clinic couples, on the other hand, respond to a PFo by their spouse with a PFo of their own; this loop is called "cross-complaining" in Table 2. Note from Table 2 that the validation sequence lasts five lags with HPFo as the criterion, and four lags with WPFo as the criterion. The transition probabilities return to unconditional base-rate levels beyond these lags. Thus, validation is a relatively short burst of interactions. Cross-complaining, on the other hand, continues into all six lags of the analysis.

The discussion continues with the mindreading code. Most mindreading is delivered with neutral affect, and Table 2 indicates that the husband's MRo functions in a similar way in both clinic and nonclinic couples, much as a feeling probe does. Couples infrequently ask direct questions about feelings—rather, they typically mindread. Mindreading by the husband with neutral affect is responded to as a sensitive probe which leads to agreement and further exploration. The wife's mindreading with neutral affect functions in a similar way only for nonclinic couples. Note, however, that the feeling probe sequence is shorter for clinic couples (two lags) than for nonclinic couples (five lags). For clinic wives, the MRo has no effect in altering the unconditional base rates of the husband's subsequent behavior—*it is thus a message with no impact,* i.e., *no communicative value*. However, Table 2 also indicates that the clinic wife's use of mindreading with positive affect does function as a feeling

TABLE 2. PHASES IN DISCUSSION OF A MARITAL ISSUE

Problem Description Phase of Marital Discussion Lag Sequential Analysis With PFo (feelings or information about a problem) as Initial Criterion Code (Only probabilities > .07 are included.)

		Lag						
		1	2	3	4	5	6	State Transition Diagram
Criterion: HPFo*	*Nonclinic*							
	WPFo	.24	.13	.18	.16	.17	.18	
	WAGo	.30*	.05	.19*	.09	.15*	.11	
	HPFo	.00	.38*	.14	.26*	.17	.22	
	HAGo	.02	.11	.07	.07	.08	.07	"validation"
	Z-score	9.77	10.31	5.11	3.57	2.38	a	
	Clinic							
	WPFo	.23*	.11	.17*	.14	.16*	.12	
	WAGo	.16	.03	.08	.05	.06	.09	
	HPFo	.00	.33*	.15	.25*	.17	.20*	
	HAGo	.01	.07	.05	.06	.06	.07	"cross-complaining"
	Z-score	3.90	9.11	2.50	5.02	1.86	2.10	
Criterion: WPFo*	*Nonclinic*							
	WPFo	.00	.28*	.15	.18	.18	.16	
	WAGo	.02	.17	.07	.16*	.07	.14	
	HPFo	.31*	.12	.24*	.17	.23	.21	
	HAGo	.19	.05	.10	.08	.07	.08	
	Z-score	3.34	6.30	2.10	2.69	a	a	
	Clinic							
	WPFo	.00	.26*	.13	.18*	.13	.17*	
	WAGo	.01	.12	.03	.07	.06	.07	
	HPFo	.29*	.09	.23*	.15	.22*	.15	
	HAGo	.14	.03	.06	.05	.08	.06	
	Z-score	4.76	6.89	3.51	2.84	3.02	2.31	

Problem Exploration Phase of Marital Discussion Lag Sequential Analysis with MRo (mindreading with neutral affect) as Criterion

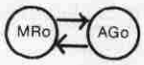
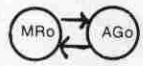
		Lag						
		1	2	3	4	5	6	State Transition Diagram
Criterion: HMRo	*Nonclinic*							
	HPFo	.28	.18	.20	.11	.28	.17	
	HMRo	.00	.18*	.06	.06	.05	.08	
	HAGo	.02	.09	.08	.05	.08	.04	
	WPFo	.15	.04	.11	.24	.14	.20	
	WAGo	.25*	.08	.18*	.09	.10	.11	
	WDGo	.09	.02	.03	.01	.04	.02	"feeling probe"
	Z-score	3.80	7.02	1.86	1.80	1.86	a	
	Clinic							
	HPFo	.23	.14	.20	.25	.12	.20	
	HMRo	.09	.14*	.08	.04	.05	.03	
	HAGo	.02	.08	.08	.06	.06	.07	
	WPFo	.14	.14	.17	.14	.16	.12	
	WAGo	.16*	.03	.07	.05	.06	.09	
	Z-score	4.07	4.69	a	a	a	a	"feeling probe"
Criterion: WMRo	*Nonclinic*							
	HPFo	.17	.12	.28*	.11	.27	.14	
	HAGo	.23*	.05	.11	.07	.11	.07	
	HDGo	.09	.02	.06	.06	.02	.05	
	WPFo	.25	.19	.15	.22	.12	.17	
	WMRo	.00	.18*	.03	.06	.02	.06	
	WAGo	.00	.09	.06	.11	.08	.10	
	Z-score	5.29	7.02	2.10	a	a	a	"feeling probe"
	Clinic							
	HPFo	.12	.18	.15	.18	.20	.16	*Clinic*
	HAGo	.12	.05	.07	.07	.06	.06	
	HDGo	.12	.01	.05	.05	.05	.05	WRMo has no communicative value for clinic couples
	WPFo	.25*	.08	.13	.17	.12	.17	
	WMRo	.00	.16*	.05	.06	.07	.08*	
	WAGo	.03	.05	.10	.01	.10	.03	
	WMR–	.09	.01	.05	.00	.02	.02	
	Z-score	3.32	5.97	a	a	a	2.06	

TABLE 2. PHASES IN DISCUSSION OF A MARITAL ISSUE continued

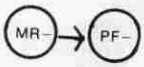
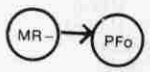
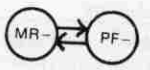
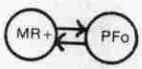
		Lag						
		1	2	3	4	5	6	State Transition Diagram
Problem Exploration Phase With Mindreading With Negative Affect as Criterion								
Criterion: HMR−	*Nonclinic*							
	HPF−	.33*	–	–	–	–	–	
	WCTo	.17	–	–	–	–	–	
	WAGo	.17	–	–	–	–	–	
	WDGo	.17	–	–	–	–	–	Cannot determine communicative value
	Z-score	7.42	–	–	–	–	–	
	Clinic					–	–	
	HMRo	.15	.12	.09				
	HMR−	.06	.09	.06	–	–	–	
	HPF−	.15*	.12	.12	–	–	–	
	HDGo	.09	.06	.06	–	–	–	
	WDG−	.09	.00	.06	–	–	–	
	WPF−	.06	.15*	.15*	–	–	–	
	WMR−	.03	.12	.06	–	–	–	"negative exchange"
	Z-score	3.34	2.28	2.28	–	–	–	
Criterion: WMR−	*Nonclinic*							
	HPFo	.20*	–	–	–	–	–	
	HAGo	.10	–	–	–	–	–	
	HDGo	.10	–	–	–	–	–	
	HPF−	.15	–	–	–	–	–	
	WPFo	.10	–	–	–	–	–	
	WMRo	.10	–	–	–	–	–	
	Z-score	5.81	–	–	–	–	–	
	Clinic					–	–	
	HPFo	.23	.03	.10				
	HDGo	.08	.04	.04	–	–	–	
	HPF−	.04	.11	.07	–	–	–	
	HDG−	.10*	.03	.06	–	–	–	
	WPFo	.07	.08	.10	–	–	–	
	WMRo	.11	.06	.06	–	–	–	
	WPF−	.12	.12	.12*	–	–	–	
	WMR−	.00	.21*	.07	–	–	–	"negative exchange"
	Z-score	5.94	8.42	2.47	–	–	–	
Problem Exploration Phase With Positive Affect Mindreading as Criterion								State Transition Diagram
Criterion: HMR+	*Nonclinic*							*Nonclinic*
	HPFo	.07	.21	.07	–	–	–	
	HMRo	.29*	.07	.14*	–	–	–	HMR+ has no communicative value for nonclinic couples
	WPFo	.00	.14	.07	–	–	–	
	WAGo	.14	.07	.14	–	–	–	
	WDGo	.14	.07	.07	–	–	–	
	Z-score	4.67	a	1.96	–	–	–	
	Clinic							
	HPFo	.11	.33*	–	–	–	–	*Clinic*
	HMRo	.22*	.11*	–	–	–	–	
	HPF+	.11	.11	–	–	–	–	HMR+ has no communicative value for clinic couples
	WPFo	.00	.11	–	–	–	–	
	WCTo	.03	.11	–	–	–	–	
	WAGo	.11	.00	–	–	–	–	
	WDGo	.04	.00	–	–	–	–	
	WPF+	.11	.00	–	–	–	–	
	WCT+	.11	.00	–	–	–	–	
	WAG+	.23	.00	–	–	–	–	
	Z-score	2.60	5.13	–	–	–	–	
Criterion: WMR+	*Nonclinic*							
	HPFo	.09	.38*	.08	–	–	–	*Nonclinic*
	HCTo	.08	.04	.04	–	–	–	
	HAGo	.13	.04	.08	–	–	–	
	HDGo	.08	.04	.00	–	–	–	
	HAG+	.08	.00	.00	–	–	–	
	HPFo	.17	.17	.13	–	–	–	
	WMRo	.21*	.04	.04	–	–	–	
	WAGo	.00	.08	.21	–	–	–	
	WMR+	.00	.08	.08*	–	–	–	
	Z-score	4.17	2.13	3.75	–	–	–	

TABLE 2. PHASES IN DISCUSSION OF A MARITAL ISSUE continued

Problem Exploration Phase With Positive Affect Mindreading as Criterion continued

		Lag						
		1	2	3	4	5	6	State Transition Diagram
Criterion: WMR+	*Clinic*							*Clinic*
	HPFo	.11	.09	–	–	–	–	
	HAGo	.17*	.09	–	–	–	–	
	HDGo	.11	.00	–	–	–	–	MR+ → AGo → CTo
	HCT+	.09	.00	–	–	–	–	
	HDG+	.09	.00	–	–	–	–	
	WPFo	.11	.11	–	–	–	–	
	WPF+	.09	.11	–	–	–	–	
	WCTo	.00	.09*	–	–	–	–	"feeling probe"
	Z-score	3.15	2.41	–	–	–	–	

Problem Solving Phase With Proposal of Solution as Criterion

		Lag						
		1	2	3	4	5	6	State Transition Diagram
Criterion: HPSo	*Nonclinic*							
	HPFo	.12	.17	.17	.21	.25	.21	
	HPSo	.00	.15	.08	.08*	.12*	.12*	PSo ⇄ AGo
	HAGo	.00	.17*	.06	.14	.14	.08	
	WPFo	.14	.14	.15	.12	.08	.17	
	WPSo	.21	.06	.14*	.08	.04	.10	
	WAGo	.31*	.02	.10	.10	.12	.08	"contract"
	Z-score	4.18	2.53	5.53	2.88	4.84	4.84	
	Clinic							
	HPFo	.20	.17	.15	.15	.21	.19*	
	HPSo	.02	.10*	.06	.06	.00	.04	PSo → AGo → PFo
	WPFo	.12	.10	.15	.19	.13	.11	
	WAGo	.12	.06	.13	.11	.06*	.04	
	Z-score	a	3.95	a	a	2.00	2.10	
Criterion: WPSo	*Nonclinic*							
	HPFo	.16	.07	.29	.14	.30	.16	
	HPSo	.11	.07	.04	.04	.05	.00	PSo ⇄ AGo
	HCTo	.13	.02	.05	.04	.02	.00	
	HAGo	.25*	.07	.11	.07	.09	.09	
	WPFo	.11	.18	.09	.21	.07	.18	
	WPSo	.00	.16*	.07*	.04	.07*	.05	"contract"
	WAGo	.02	.13	.04	.14	.07	.11	
	Z-score	4.67	7.07	2.52	a	2.52	a	
	Clinic							
	HPFo	.09	.20	.16	.18	–	–	
	HPSo	.20*	.02	.11*	.05	–	–	WPSo ⇄ HPSo
	HAGo	.11	.04	.02	.09	–	–	
	HDGo	.18	.04	.05	.02	–	–	
	WPFo	.13	.09	.07	.02	–	–	
	WPSo	.00	.16*	.07	.07*	–	–	"counterproposal"
	Z-score	8.16	6.55	4.21	2.31	–	–	
Criterion: WPS+	*Nonclinic*[b]							
	HPFo	.09	.09	–	–	–	–	
	HCTo	.18	.00	–	–	–	–	
	HAGo	.27*	.09	–	–	–	–	
	HPF+	.09	.00	–	–	–	–	
	HPS+	.09	.00	–	–	–	–	WPS+ → HAGo → WPSo
	HPSo	.00	.09	–	–	–	–	
	WPFo	.00	.18	–	–	–	–	
	WPGo	.00	.09	–	–	–	–	
	WAGo	.00	.18	–	–	–	–	
	WPSo	.00	.09*	–	–	–	–	
	Z-score	2.38	4.38	–	–	–	–	

[a]None greater than 1.96; *i.e.*, all conditional probabilities are at expected unconditional level.
[b]WPS+ not frequent enough to do sequential analysis of Clinic couples.
*Indicates sequence.

probe, with the exception that it leads to the wife's communication talk (communication about the communication process). The nonclinic wife's positive mindreading func-

tions only to lead to the husband's elaboration of feelings or information about the problem, with no cycle through agreement as in the validation loop. The analyses of positive mindreading in Table 2 could only be carried to three or two lags because this code was relatively infrequent, especially for clinic couples.

Mindreading with negative affect is reciprocated in clinic couples by a statement of feelings about a problem delivered with negative affect (PF-), whether it is delivered by husband or wife (see Table 2). The behavior occurs too infrequently in nonclinic couples to describe the sequence reliably, but it does not seem to have serious consequences in the sense of leading to a negative affect loop. In clinic couples, mindreading with negative affect is taken as a blaming criticism which is refuted by either spouse with negative affect.

The discussion continues until a proposal for solving the problem (PS) is made. Table 2 shows that nonclinic couples are likely to engage in a sequence that intersperses agreement with proposals for solving the problem. This sequence is called "contract" in Table 2. On the other hand, interspersals of agreement are less likely for proposals made by clinic husbands, and nonexistent for proposals made by clinic wives. In fact, the sequence following a WPSo does not cycle through agreement but is one in which proposal is met by counterproposal. Proposals for problem solving are essentially made with positive affect only by nonclinic wives, and this sequence also resembles the contract sequence.

Reciprocity of Affect

Analysis of affect sequences consists of two parts—the tendency to drift away from neutral affect and the tendency to reciprocate positive or negative affect. There was a greater likelihood for nonclinic couples to stay in a neutral affect state [Z (H → W) = 9.28, Z (W → H) = 8.55] than for clinic couples [Z (H → W) = 6.19, Z (W → H) = 9.01].

To assess the adequacy of the first-order Markov model, estimates of the lag-two transition probabilities can be obtained by applying the lag-one matrix twice; that is, by multiplying the lag-one matrix by itself. The fit was good only for transitions to the high frequency codes Ho and Wo. *Table 3 thus demonstrates the inadequacy of the first-order Markov model.* This test is not designed to test the steady state adequacy (*i.e.*, the prediction made by the first-order model after a large number of lags), but to assess whether or not new information is obtained by the lag sequential analyses.

TABLE 3. ASSESSMENT OF THE ADEQUACY OF A FIRST-ORDER MARKOV MODEL TO FIT LAG-TWO AFFECT DATA (ACTUAL PROBABILITIES IN PARENTHESES)

	Lag-Two Consequent					
Antecedent	Ho	H+	H−	Wo	W+	W−
Nonclinic						
Ho	.75 (.78)	.08 (.06)	.04 (.03)	.06 (.05)	.06 (.05)	.03 (.03)
H+	.56 (.45)	.09 (.24)	.03 (.00)	.24 (.22)	.05 (.07)	.02 (.03)
H−	.45 (.37)	.06 (.04)	.05 (.20)	.36 (.33)	.07 (.02)	.03 (.04)
Wo	.08 (.07)	.04 (.03)	.02 (.01)	.72 (.74)	.12 (.11)	.04 (.03)
W+	.24 (.22)	.03 (.03)	.01 (.01)	.56 (.50)	.14 (.23)	.04 (.01)
W−	.27 (.20)	.03 (.01)	.01 (.01)	.52 (.50)	.10 (.06)	.06 (.19)
Clinic						
Ho	.56 (.67)	.04 (.04)	.10 (.07)	.12 (.10)	.08 (.07)	.10 (.06)
H+	.42 (.38)	.09 (.19)	.09 (.05)	.26 (.23)	.06 (.12)	.08 (.03)
H−	.42 (.26)	.03 (.03)	.15 (.38)	.24 (.15)	.08 (.06)	.08 (.13)
Wo	.13 (.11)	.05 (.05)	.10 (.06)	.48 (.58)	.10 (.10)	.15 (.11)
W+	.25 (.23)	.03 (.08)	.07 (.02)	.35 (.37)	.16 (.26)	.14 (.04)
W−	.23 (.14)	.04 (.00)	.06 (.11)	.37 (.25)	.10 (.04)	.20 (.46)

Table 4 presents the results of the analysis of reciprocity of negative and positive affect for clinic and nonclinic couples. Negative affect cycles seem likely for both groups of couples, although the size of the Z-scores is generally larger for *clinic* couples. This finding would be consistent with clinical folklore which suggests that clinic couples are more likely to be involved in negative cycles than nonclinic couples. Table 4 also presents the results of the analysis of positive reciprocity. The two groups of couples do seem to differ in the amount of positive reciprocity at early lags, with clinic couples showing more reciprocity of positive affect than nonclinic couples, although nonclinic

TABLE 4. RECIPROCITY

A. Reciprocity of Negative Affect

Criterion:	Lag					
H−	1	2	3	4	5	6
Nonclinic						
H−	.00	.20*	.08	.14*	.08	.06
W−	.16*	.04	.14*	.14	.12	.06
Z-score	4.77	8.38	4.08	5.54	3.31	a
Clinic						
H−	.00	.38*	.13	.22*	.22*	.22*
W−	.34*	.13	.26*	.18	.20	.18
Z-score	7.49	12.89	5.44	5.53	5.53	5.79

Criterion:	Lag					
W−	1	2	3	4	5	6
Nonclinic						
H−	.19*	.01	.16*	.01	.12*	.01
W−	.00	.19*	.07	.10*	.05	.19*
Z-score	9.23	7.18	7.91	2.77	5.60	7.18
Clinic						
H−	.27*	.11	.21*	.16	.19*	.17
W−	.00	.46*	.15	.29*	.20	.23*
Z-score	7.87	15.18	6.01	7.38	4.68	4.65

B. Reciprocity of Positive Affect

Criterion:	Lag					
H+	1	2	3	4	5	6
Nonclinic						
H+	.00	.24*	.08	.30*	.16*	.09
W+	.27*	.07	.14*	.15	.10	.12
Z-score	6.44	8.48	2.05	3.34	4.94	a
Clinic						
H+	.00	.19	.11*	.09*	.09	.09*
W+	.37*	.12	.16	.13	.16*	.15
Z-score	8.69	6.34	2.86	2.76	2.87	2.76

Criterion:	Lag					
W+	1	2	3	4	5	6
Nonclinic						
H+	.19*	.03	.09	.05	.06	.11*
W+	.00	.23*	.09	.13	.14*	.11
Z-score	6.99	6.60	a	a	2.53	2.92
Clinic						
H+	.19*	.08	.07	.09	.09	.09*
W+	.00	.26*	.15*	.13	.16*	.15
Z-score	7.80	7.85	2.61	a	2.87	2.76

*Indicates sequence.

couples show more positive reciprocity than clinic couples at later lags. Both groups of couples show less reciprocity of positive affect than they show reciprocity of negative affect. This complex pattern of results suggests that notions of reciprocity may have to be modified to include the concepts of affect and lag.

As another check on the reciprocity issue, the point system graphs for the five distressed and five nondistressed couples were used because they combined positive and negative content and affect behaviors. Analyses of covariance with base rate unconditional probabilities as the covariate for conditional probabilities were performed for both negative and positive points using the point system graphs. The floor switch is the sequence unit for the reciprocity analyses. Table 5 presents the results of these analyses. There was, therefore, evidence that greater reciprocity of positive exchange is characteristic of nondistressed couples' interaction compared to the interaction of distressed couples. However, this was true only for increasing prediction of the wife's reciprocation of the husband's positive behavior. In general, despite the intuitive appeal of a reciprocity theory, there does not seem to be strong evidence in the present investigation to support the notion that reciprocity is the *sine qua non* index that discriminates clinic from nonclinic couples. Rather, the patterns discovered in the present investigation suggest greater complexity than a reciprocity theory would propose.

TABLE 5. ANALYSES OF COVARIANCE FOR POSITIVE AND NEGATIVE RECIPROCITY

Variable	Distressed Mean	Nondistressed Mean	*F*-ratio[a]	*p*
p(W+)	.30	.49		
p(W+/H+)	.29	.50	4.68	< .05
p(H+)	.20	.38		
p(H+/W+)	.24	.47	1.92	ns
p(W−)	.38	.11		
p(W−/H−)	.55	.17	.26	ns
p(H−)	.31	.11		
p(H−/W−)	.44	.19	3.04	< .10

[a]df = (1, 13).

Context Effects

To analyze the effects of the nonverbal behavior of the listener, two kinds of analyses were performed—contingency table analyses to determine the extent to which the listener's nonverbal behavior was negative concurrent with the speaker's neutral or positive nonverbal behavior, and one analysis of the ability of the listener's nonverbal behavior to predict that person's subsequent lag-one nonverbal speaker affect.

This latter conditional probability may relate to a cognitive "editing" function if it were the case that nonclinic couples were less likely than clinic couples to become negative speakers after they had just been negative listeners. The clinic wife is more likely to be a negative listener than the nonclinic wife

[X^2 (1) = 87.69, $p < .001$], and the clinic husband is more likely to be a negative listener than the nonclinic husband [X^2 (1) = 334.91, $p < .001$]. The nonclinic wife is a negative listener 3.87 percent of the time, while the clinic wife is a negative listener 18.01 percent of the time. The nonclinic husband is a negative listener 6.21 percent of the time, while the clinic husband is a negative listener 30.06 percent of the time. Clinic husbands are more likely to be negative listeners than their wives [X^2 (1) = 17.83, $p < .001$], whereas the opposite is true for nonclinic couples; that is, nonclinic wives are more likely to be negative listeners than their husbands [X^2 (1) = 30.97, $p < .001$].

The probability that the husband's negative behavior as a listener would transfer to his immediately consequent negative speaker affect was equally high for both nonclinic ($p = .20$, $Z = 3.30$) and clinic husbands ($p = .27$, $Z = 3.93$). However, clinic wives were far more likely ($p = .35$, $Z = 4.04$) than nonclinic wives ($p = .03$, $Z = .06$) to become negative speakers after they had been negative listeners. If there is a cognitive editing process that moderates between listening and speaking, it is the nonclinic wife, not the nonclinic husband, who performs this editing role.

CONCLUSION

The present investigation demonstrated the discriminative power of independently coding the content of messages, their nonverbal delivery and their nonverbal reception. Five codes contributed to the significant multivariate main effect for the distress factor: agreement with neutral affect; expressing feelings about a problem with negative affect; mindreading with negative affect; agreement with negative affect; and disagreement with negative affect.

The present investigation also made it possible to separately test agreement to disagreement ratios and nonverbal delivery as positive or negative as variables capable of discriminating distressed from nondistressed couples. These two aspects of agreement and disagreement are usually confounded in studies of family interaction (for example, see Riskin and Faunce, 1972; Alexander, 1973). Positive content codes discriminated distressed from nondistressed couples, but positive nonverbal codes did not. However, negative and neutral nonverbal codes did discriminate distressed from nondistressed couples. Distressed couples were also more likely to deliver a larger proportion of their summary statements as summarizing self rather than summarizing the other, and to deliver their mindreading statements with negative affect as compared to nondistressed couples. Nonverbal behavior was a better discriminator between distressed and nondistressed couples than verbal behavior was.

Clear differences in interaction patterns between clinic and nonclinic couples were obtained by the sequential analyses. Sequential analyses indicated that clinic couples are likely to enter a cross-complaining loop at the beginning of a discussion; they are subsequently likely to enter a negative exchange loop (MR- → PF-), and likely not to enter a contract loop at the end of the discussion. On the other hand, nonclinic couples are likely to begin with a validation sequence, to avoid negative exchanges, and to end the discussion with a contract sequence. The sequential analyses of both content and affect codes taken together thus provide summary descriptions of sufficient detail to suggest two different topographies for the two groups of couples. They do not simply differ in response frequencies, but they traverse essentially different terrains in their interaction.

The present investigation found some support for a reciprocity model, although the power of a reciprocity model to discriminate distressed from nondistressed marriages was not as impressive as other variables in the present investigation. Controlling for base rate differences, clinic couples were somewhat more likely than nonclinic couples to reciprocate positive affect at early lags, while nonclinic couples were somewhat more likely than clinic couples to reciprocate positive affect at later lags. Both groups of couples were more likely at all lags to reciprocate negative affect than positive affect, with clinic couples showing a greater tendency to reciprocate negative affect than nonclinic couples. In an analysis that combined both verbal and nonverbal positive and negative behaviors, support was again obtained for a reciprocity hypothesis, but the magnitude of the differences was not impressive. Therefore, the present investigation does not provide strong support for the most popular model of good communication represented by

current behavioral interventions with distressed marriages (for example, see Azrin *et al.*, 1973; Lederer and Jackson, 1968; Rappaport and Harrell, 1972; and Stuart, 1969).

To summarize, the present investigation included: (1) methodological innovations in coding, analyzing results, and presenting data; and (2) tests of specific hypotheses about distressed and nondistressed marital communication. The findings of this study are limited. This relatively small sample of couples had only been married an average of three-and-a-half years and were drawn primarily from a university community. Replication and extension of these results are underway in our laboratory.

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