THE QUANTITY AND QUALITY OF
MARITAL INTERACTION RELATED TO MARITAL
SATISFACTION: A BEHAVIORAL ANALYSIS

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An assessment instrument is presented for the evaluation of the quantity and quality of dyadic interaction, as well as for the daily recording of behaviors presented and omitted which influence marital satisfaction. Comparison of data from ten happy couples and from ten couples entering therapy indicated two distinct dysfunctional patterns among distressed couples, with significantly different patterns of time-together and positive/negative ratios differentiating the happy *versus* therapy groups. Independent behavioral recording for 14 consecutive days significantly increased husband-wife *agreement* on a traditional adjustment questionnaire without significantly increasing or decreasing the level of satisfaction being assessed. There was no difference between groups as to interspousal agreement on *amount* of time together. However, the happy couples agreed on daily *quality* ratings of the 72 15-minute segments significantly more often than did the distressed couples. Couples at the extremes of the happy-distressed continuum reported rewarding and punishing, respectively, in response to the partners *presence*, regardless of behaviors emitted. Midrange happy couples defined "pleasant" as positive behaviors *presented*; midrange distressed couples defined "pleasant" as negative behaviors *omitted*. Theoretical and clinical implications of behavioral analysis of sequential patterns are discussed.

DESCRIPTORS: marital interaction, marital satisfaction, time lines, therapy assessment, dyadic, home monitoring, married adults

When Cinderella was courted by Prince Charming, they spent every available moment in each other's arms. They laughed and smiled and danced together and, as every reader knows, it was predicted from these behaviors that they would "live happily ever after." However, in the modern-day version of the tale, after the wedding, what with diapering princes and princesses and slaying dragons, they no longer "find the time" for laughing and smiling and dancing together. Based on these new behaviors, what

predictions can now be made about the future of a contemporary Cinderella and her Prince?

This paper maintains that there is a systematic relationship between the enjoyment and satisfaction derived from couple interaction and the amount of time couples spend together. It proposes that the quantity and quality of marital interaction are a matter of active choice and can be used both clinically and experimentally as indices of dyadic functioning and dysfunctioning.

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THEORETICAL RATIONALE

The reinforcement-attraction hypothesis (Stuart, 1969) maintains that attraction and liking are associated with the exchange of positive behaviors, while repulsion and disliking are associated with negative, punitive, and coercive social exchanges. The present work suggests an *access-opportunity* corollary to this hypothesis,

namely, that marital partners who are usually made happy by their interactions will arrange to spend more time with each other. The time spent together is maximized because it is associated with the receipt of reinforcement. An effort is made, therefore, to gain *access* to the rewarding person and thereby to arrange the *opportunity* to be reinforced. Conversely, when time together is associated with punitive exchanges, coercion, or the relative absence of rewards (e.g., boredom), interaction with the partner may be escaped or avoided, and replaced by more rewarding activities.

This access-opportunity hypothesis holds that the frequency and intensity of the "work" that couples do in order to be together is a function of the ongoing reward:cost ratio in their interactions as well as each partner's comparison level for alternative sources of reinforcement (Thibaut and Kelley, 1959).

LIMITATIONS OF AVAILABLE ASSESSMENT METHODS

Quantity of Marital Interaction

Previous studies that have analyzed amount or duration of marital interaction have either omitted the analysis of marital adjustment or have used only gross estimations of the quantity of marital and family interaction. For example, Szalai (1972) and his colleagues computed time spent in daily activities based on records kept in 15-min segments, broken down according to sex, employment, time of week, interaction pattern, and country. No qualitative ratings of marital satisfaction were made. As another example, Marini (1976) measured the quantity of marital interaction by a single question:

On the whole, would you say you spend a lot of time, a moderate amount of time, or relatively little time doing things together with your (wife/husband)? (p. 444-445)

Although Marini's results supported the hypothesis that companionship and mutual satisfaction are related to marital happiness, the interview

question was global and retrospective. Other studies (Benson, 1952; Hawkins and Walters, 1952; Klausner, 1968) looked at the relationship between dyadic satisfaction and one-to-one interaction by studying the number of shared leisure activities, with child care tasks and household management excluded. Amount of time spent together was inferred from shared marital and family activities but was not measured directly.

Quality of Interaction and Marital Satisfaction

Orthner (1975) and Birchler, Weiss, and Vincent (1975) developed scales to assess one perspective of the quality of marital interaction, namely, who was present during the activity. The Leisure Activity Interaction Index, developed by Orthner, and the Marital Activities Inventory, developed by Birchler *et al.*, assess the frequency of leisure activities engaged in alone, with spouse, and/or with others. These reports are retrospective and limited to leisure activities.

In order to analyze the positive/negative aspect of couple interaction, Birchler *et al.* (1975) had spouses record Pleasing (P) and Displeasing (D) behaviors that their partners emitted. The authors noted: "The *ratio* of Ps/Ds controlled for the differences in time spent together by the couples" (p. 356) (Emphasis added). Although these ratings were not limited to leisure activities and were done in the natural environment, they did not actually measure interaction time nor take into account the impact of omitted behaviors which might affect the relationship. The quality of husband-wife interaction has been analyzed further using the Marital Interaction Coding System (MICS) during laboratory samples of casual conversation and problem-solving (Weiss, Hops, and Patterson, 1973). While the MICS is a valuable research tool, it requires videotape equipment and/or outside observers which may alter the intimate interactions being studied. The Spouse Observation Checklist (SOC) was used in a study by Wills, Weiss, and Patterson (1974) to record positive

and negative instrumental behaviors (*e.g.*, child care, finances) for 14 consecutive days. A wrist-counter was used to count pleasurable and displeasurable affectional behaviors (*e.g.*, insults). Couples were also asked to make a joint estimate of time spent together each day. Data recorded at home were reported to the experimenters in two daily phone calls which may have had an impact on subsequent recording by the reporting spouse, despite instructions to record independently.

The third perspective on the quality of marital interaction asks if the behaviors are exchanged contingently or not, reciprocally or not. Gottman, Notarius, Gonso, and Markman (1976) redefined reciprocity in terms of probability: would a particular behavior code (positive or negative) emitted by one spouse affect the probability of emission of a subsequent code by the other spouse?

Gottman, Notarius, Markman, Bank, Yoppi, and Rubin (1976) addressed the issue of probability of reciprocity using laboratory samples of behaviors on high-conflict and low-conflict marital decision-making tasks. Later, Gottman, Markman, and Notarius (1977) used videotape samples of conflict resolution behavior to analyze the topography (verbal and nonverbal) of marital conflict. Although the use of videotapes allows a microscopic analysis of interaction sequences, the constraints of the artificial setting and structured tasks may limit the generalizability of the data. Furthermore, the outside observers lack the reinforcement history of the dyad.

MARITAL SATISFACTION TIME LINES

Rationale

The Marital Satisfaction Time Lines (MSTL) were developed to provide an assessment procedure which (1) was inexpensive to use, (2) could be used in the natural environment, (3) would not require outside observers, and (4) was prospective and specific rather than retro-

spective and global. Furthermore, it was felt that the amount of time spent together and the perceived quality of the time might be a useful index of dyadic functioning independent of the theoretical persuasion of the clinician or researcher and unbiased by the socio-economic background or educational level of the subjects (appropriate norms for subgroups could be determined).

The recording of pleasing and displeasing behaviors (Birchler *et al.*, 1975) and the use of the Spouse Observation Checklist (Wills *et al.*, 1974) meet the criteria for home use, being inexpensive to use, and not requiring outside observers in the home. However, both procedures assume that the most important elements of marital interaction are the observable behaviors emitted by each spouse. This time-line approach can also record forms of dyadic interaction characterized by continuous interaction rather than by units of behavior that the research participants can discriminate as discrete. Furthermore, because the time-line format does not depend on a checklist of emitted behaviors, it allows for the recording of the lack of an expected behavior (*e.g.*, "He forgot to buy me an anniversary card or gift." or "She didn't nag me about the garbage for a change."). The person who is recording defines what made an interval pleasant or unpleasant, which facilitates a functional analysis of the marital interaction. Behaviors which occur but are ignored by the spouse (*i.e.*, nonfunctional behaviors) would not be reported on the time-line diaries.

In terms of the three perspectives of the quality of marital interaction (Who is present? Were the activities pleasant/unpleasant? Were the exchanges contingent; reciprocal?), the time lines can potentially give relatively precise information on the first two perspectives, but only circumstantial evidence on the third. The qualitative time-line data, based on reports of the *most* pleasant, the *least* pleasant, and *what could have been done* behaviors (see below), include behaviors having the greatest impact on an interaction segment and do not involve a consecu-

unpleasant) can be collapsed to a 3-level scale. A summary is made of the number of segments of each level per day of recording (*e.g.*, 12 pleasant, 6 neutral, 2 unpleasant) and a ratio of pleasant to unpleasant (*e.g.*, 12:2) is calculated. These ratios can be compared with the pleasing: displeasing ratios reported by Weiss (1978). Percentage time together is calculated by dividing the total number of 15-min intervals marked (all levels combined) by the total number of intervals available based on an 18-hour recording day ($72/\text{day} \times 14 \text{ days}$). The base recording period, 6:00 a.m. to 12:00 p.m., can be shifted to accommodate couples whose marital interaction is consistently on a different schedule (*e.g.*, 9:00 a.m. to 3:00 a.m.).

The most pleasant and least pleasant behaviors are available for qualitative analysis (*e.g.*, instrumental *vs.* affectional behaviors; behaviors emitted *vs.* omitted). These functional behaviors as well as the daily activities reported can be quantified in terms of the frequencies and durations of specific behaviors (*e.g.*, telephone calls to spouse, sex, TV watching). Other clinical uses of the time-line patterns and sequences have been demonstrated elsewhere (Williams, 1978).

DAILY RATING SCALES

Attached to the Marital Satisfaction Time Lines is a set of four daily rating scales: overall marital happiness, satisfaction with work, satisfaction with self, and perception of spouse's satisfaction with self. The one for our consideration, the Marital Happiness Scale, asks that the degree of unhappiness/happiness experienced that day be rated on a scale from 1 to 9 (9 = very happy) Azrin, Naster, and Jones, 1973).

PRELIMINARY STUDY

Purpose

This study was conducted to provide preliminary information on the utility of the Time Lines as a behavioral measure of marital interaction.

The primary goals of the study were: (1) to see if the quantity and quality of marital interaction could be used to discriminate between happy and distressed groups of couples; (2) to see how the quantity and quality of marital interaction (as recorded on the Time Lines) were related to marital satisfaction (as measured by the Locke-Wallace [1959] Marital Adjustment Scale); (3) to see if the Time Lines could be used for independent spouse-recording without significantly increasing or decreasing marital satisfaction (as measured by the Locke-Wallace scale); and (4) to see if the Time Lines could offer information about marital interaction not available from behavioral checklists and frequency counts.

Regarding the ability to discriminate between groups of happy couples and distressed couples, it was predicted that distressed couples would spend significantly less total time together during the recording period than would the happy couples. It was also expected that distressed couples would spend less positive time together relative to their total interaction time. That is, the ratio of positive time:total time together was expected to be significantly lower among distressed couples. In addition, it was hypothesized that the ratio of negative time:total time together would be significantly higher among distressed couples. Finally, it was predicted that the ratio of positive time to negative time would be significantly lower among distressed couples.

Method

Subjects. The participants were two groups of 10 couples, one group "happy" and the other group "distressed," married more than one year, but less than six. Half of the couples in each group had at least one preschool child. The distressed couples averaged 25.5 years of age ($SD = 3.5$), while the happy couples averaged 24.5 years ($SD = 3.3$). Each couple was offered a detailed analysis of their marital interaction in exchange for their participation in the research.

The 10 distressed couples were referred to the study by local counseling agencies, including

the regional community mental health clinic. These couples were seen as soon as possible after intake or during the therapist's evaluation process (2 to 4 sessions). Couples were *not* seen for therapy during the recording period.

Ten happily married couples were sought through contact to every fourth number in a computer list of married university students, beginning with the letter "H." These telephone calls generated a list of peer referrals of couples perceived as happily married by their friends. Nonstudent referrals were sought such that 28 of the 40 participants were nonstudents.

In addition to peer referral, each partner had to agree independently that he or she was happily married. Couples with scores below 100 points or with widely dissimilar scores on the revised Locke-Wallace Marital Adjustment Scale (MAS) (Kimmel and Van der Veen, 1974) were excluded. Additionally, the Edmonds (1967) Marital Conventionalization Scale (MCS) was used to screen couples with above-average social desirability response bias. Finally, a 1- to 2-hour home visit was made in conjunction with the pretest evaluation. Couples showing evidence of serious marital tension, based on informal observation, were excluded from the happily married group.

During the debriefing interview after posttest evaluation, it was learned that one happily married couple had violated the experimental condition requiring independent ratings by exchanging completed time lines each night "as an enrichment exercise." As a consequence, they were replaced with another couple.

A Fisher's Randomization of Maximal Z-Statistic (one-sided) (Boyett and Shuster, 1977) was done using pretest MAS and MCS scores (and other scores reported in Williams, 1978) to confirm that the two groups represented extremes of marital satisfaction. The distressed and happy spouses were significantly different on both tests ($p < .00002$).

Procedure. Each participant completed the MAS and MCS pretest questionnaires without

consulting his or her spouse. A 2-week supply of Time Line forms with Daily Rating Scales attached and 14 preaddressed stamped envelopes were given to each partner for independent recording and reporting. In order to ensure daily recording and confidentiality (*i.e.*, so the wife could not see her husband's forms and *vice versa*), each day's data were returned by mail the following day. As soon as possible after completion of the 14-day recording period, a second home visit was made for posttest evaluation (again using the MAS and MCS), debriefing, and feedback.

Dependent variables. The primary dependent variables were the quantity and quality of marital interaction as measured by the Time Lines. The unit of measurement was the 15-min segment of interaction rated for level of satisfaction. Base rate cumulative totals of each quality of time together (pleasant, neutral, and negative) were used to investigate the effects of independent variables differentiating the two groups (*i.e.*, therapy *vs.* happy, and parental status). Two secondary dependent variables were explored for the ability to differentiate happy and distressed groups: (1) husband-wife agreement on the Time Line recording; and (2) daily ratings of overall marital happiness (on 1 to 9 scale).

The independent variables used to differentiate the two groups at pretest, the MAS and MCS, were then used as dependent variables in order to study potential reactivity of the time-line procedure. Change-scores from pre- to posttest on the MAS and MCS were used to assess the impact of 14 days of self- and spouse-monitoring.

Other dependent variables studied (*e.g.*, communication scores, leisure activity interaction reports, and accuracy of perception of spouses) are reported elsewhere (Williams, 1978).

Results

Fisher's randomization of maximal Z-statistic. A Fisher's Randomization of Maximal Z-Statistic (one-tailed) (Boyett and Shuster, 1977) was

used to test the hypotheses regarding differences between the groups in the amount of time together and perceived quality of interaction. This analysis is suited to multivariate two-sample problems (happy *vs.* distressed) involving small samples with the advantages of being exact, non-parametric, and offering the option of one-tailed directionality (Boyett and Shuster, 1977). It was useful here because of the small sample size and large number of variables to be analyzed (Chung and Fraser, 1958). The randomization was calculated to compare the happy couples with the therapy couples on eight variables: the cumulative totals of time together in four types of interaction (unpleasant, neutral, pleasant, and noncontact), reported separately by husbands and wives.

This first multivariate randomization was not significant ($p > .10$) for differences between the happy and distressed groups in these eight variables as originally hypothesized. However, case study analysis of the data revealed that two of the distressed couples had spent extraordinarily large amounts of time together.

In an effort to show statistically that those two couples formed a separate dysfunctional group, an analysis of the variance within the happy and distressed groups was done using the ratios of two Chi squares (variance of time together in the distressed group divided by the variance of time together in the happy group). The F thus generated showed a significant difference ($p < .05$) between the variances in the two groups. The F 's were then calculated for husbands and wives separately, and again both differences in variance were significant ($p < .05$). It was also calculated that 74% of the variance in the therapy group was accounted for by the two couples who spent inordinately large amounts of time together. Thus, the therapy group was two distinct groups. Because the original hypotheses did not foresee couples characterized by this second dysfunctional pattern, it is not surprising that those hypotheses were not supported by the initial analysis.

In order to better understand the first dysfunctional pattern, the overall Fisher's Randomization was recalculated comparing the eight "too little time" couples with the 10 happy couples. Significant differences were found between the two groups since, of the 15,876 possible allocations in the randomization, there were only 651 allocations that had the maximal Z-statistic of 2.27 or larger (the maximal Z-value for the eight variables). The probability of this outcome or one more extreme was 651/15,876 (that is, $p < .041$).

Happy vs. therapy. Total time-together and positive time-together were significantly higher for the happy couples ($p < .05$), but negative time was higher for the therapy couples only in that it made up a significantly larger portion of the total time together than for the happy couples ($p < .05$). The happy couples spent an average of 6.6 hours per day together, averaging weekdays with weekend days, whereas the therapy couples spent an average of 5.2 hours per day together. For the happy couples, 18.2 min were negative of the 6.6 hours per day together. For the therapy couples, 26.6 min were negative of the 5.2 hours per day together. The ratios of positive time to negative time (15.3:1 for happy couples, 63:1 for the eight therapy couples) were able to discriminate between the two groups at the .05 level.

Parental status. Figure 2 shows both the difference between happy couples and therapy couples in the cumulative ratings of quality of time together, and the differences between couples with and without children in each group. The happy couples who were childless showed the maximum positive time-together and minimum negative time-together (excluding the two distressed couples who reported "too much time together") (+:- ratio = 16:1). The happy couples with children showed less positive time, more neutral time, and slightly less negative time. The positive/negative ratio (14:1) was not significantly less than the same ratio for the childless happy couples ($p > .10$). Com-

Fig. 2. Ratings of time together by group and parental status (total minutes over 14 days).

ments on the time lines described a larger portion of the husband-wife time together as family interaction rather than as marital interaction, with much of the evening time taken up with routine child care responsibilities.

In contrast, the distressed couples with children reported more interaction that was pleasant and less interaction that was unpleasant than did the childless distressed couples. Over the 14-day recording period, the therapy couples with children averaged 20 hours (1,200 min) more time together (+:- ratio = 4.4:1) than did the childless therapy couples (+:- ratio = 8.8:1). Of the additional 20 hours per couple,

an average of 89% (17 hours, 47 min) was rated as pleasant.

Secondary variables. An overall multivariate Fisher's Randomization of Maximal Z-statistic was calculated to compare the happy couples ($N = 10$) with the therapy couples ($N = 10$) on 34 secondary variables. This overall multivariate test was calculated prior to individual tests to avoid the possibility of experiment-wide error due to spurious association as a result of running 34 separate tests of significance (Boyett and Shuster, 1977; Chung and Fraser, 1958; Fleiss, 1973). In only one outcome of the 63,504 possible allocations was the maximal Z-statistic

larger than the 2.61 which was the maximal Z-value for the 34 variables. Hence, the overall probability that the observed outcome was due to chance equaled $2/63,504$ or $p < .00003$. Space limitations preclude discussion of all 34 variables which have been described elsewhere (Williams, 1978). Nine variables are presented here because of their theoretical or statistical significance. The remaining 25 nonbehavioral variables are not germane to this discussion.

Reactivity. MAS and MCS were used to determine whether or not the Time Line procedures were reactive. Thus, both questionnaires were given prior to and immediately following the recording period. The MAS scores were not significantly increased or decreased either in the happy couples or in the therapy couples. The MCS (response bias) scores of the husbands (but not the wives) in the two groups were significantly affected by the self- and spouse-monitoring procedures ($p < .05$).

Another reactivity question is whether the independent husband and wife adjustment scores were made more congruent after 2 weeks of focused attention on the marital relationship. The correlation between husband and wife MAS scores could be expected to increase after behavioral recording in the home. The husband-wife correlation for the pretest MAS scores was $r_{pre} = .855$. At posttest the husband-wife correlation was $r_{post} = .905$; this increase was significant at the .05 level using Fisher's r to Z transformation (Hays, 1963). If the concept "accuracy of perception" can be applied to the global, retrospective rating of marital relationships (e.g., MAS) then the significantly increased concordance of the husband-wife adjustment scores suggests greater accuracy *after* a home-based behavioral recording procedure.

Social desirability response bias. There was a significant difference ($p < .01$) between the happy couples and the therapy couples in MCS social desirability response bias. The happy couples had significantly higher pretest scores and showed more discrepancy between husband and wife ratings ($p < .01$). At pretest the husbands

in the happy group had scored significantly higher ($p < .05$) than the husbands in the therapy group. The therapy husbands, in contrast, scored in the very low, very candid range, which is consistent with their having already publicly admitted to marital problems by entering marital therapy. Pre- to posttest changes were significant ($p < .05$): the inflated scores of the happy husbands dropped an average of 5.7 points, while the deflated scores of the distressed husbands rose an average of 3.3 points.

Agreement. The happy and distressed groups were compared as to how well the members of each couple agreed on the *amount* of time together and the *quality* of that time. For the purposes of this study, each of the time segments (72 15-min intervals/day over 14 days) for each husband was matched with the corresponding time-segment for his wife (Fleiss, 1973).

The first comparison (Fleiss Kappa) analyzed the husband-wife agreement on the *amount* of time together, that is, time-together *vs.* time separated. There was no significant difference between the happy and distressed groups as to interspousal agreement on when the couples were together or not together ($p > .10$). Thus, while happy couples agreed on together *vs.* separated in 92.6% of the recording intervals, the therapy couples agreed on 89.6%. This roughly 10% discrepancy is consistent with a margin of recording error.

In the second comparison, the happy couples showed significantly more agreement as to the *quality* of their time together, that is, their ratings agreed in 76.8% of the intervals. Because negative intervals for either partner were usually followed by a shift to negative for both until the conflict was resolved, the happy partners agreed not only when the interaction was pleasant, but also when there was discord between them. The distressed couples, on the other hand, showed significantly less agreement as to their ratings of quality ($p < .001$), that is, they agreed in only 67% of the ratings. Thus, even though the distressed partners reported that 50% of their marital interaction was pleasant,

it was frequently *not* mutually pleasant for both partners. Their daily records more often showed that conflicts were either not recognized or were not resolved to the satisfaction of both partners. Because aversive behaviors can continue to occur without the instigator's awareness of the negative impact of his or her behavior, this lack of accurate or congruent perception points to a source of serious conflict. It is important to note that distressed couples may be in total agreement as to the general state of their relationship on a traditional adjustment questionnaire, yet show marked discrepancies in their ratings of ongoing interaction.

Daily ratings of marital happiness. As part of the Fisher's Randomization of Maximal Z-statistic, the two groups were also found to be significantly different in their daily ratings of overall marital happiness on a scale from 1 to 9 (9 = very happy). The happy husbands averaged 7.10 which was significantly higher ($p < .05$) than 6.20 averaged by the therapy husbands. The happy wives averaged 7.16 which was also significantly higher ($p < .01$) than the 6.06 averaged by the therapy wives. This significant difference in daily ratings is not felt to be a result of response bias in ratings, because no differences were found between groups in their daily ratings of satisfaction with work, satisfaction with self, and perception of spouse's happiness. If all four daily rating scales showed significant differences between groups, then the marital happiness ratings might have been challenged as being unable to discriminate accurately general satisfaction with one's job and with one's self from happiness in one's marital relationship.

In order to determine husband-wife interrater reliability on the 1 to 9 daily ratings of marital happiness, a split-half analysis was done by calculating the correlation between the number of husband-wife agreement on odd and even days (Rulon, 1939). The Spearman-Brown formula was used to estimate the interrater reliability for this daily rating scale: $r_{\text{happy}} = .727$

and $r_{\text{therapy}} = .438$. The therapy group rating showed a wider range, including the lower end of the scale, and greater discrepancy between ratings of the same day (for example, husband rates day as "8" but wife rates day as "4").

Qualitative analysis. The content of the interaction intervals was markedly different for the happy couples as compared to the distressed couples. Although the behavioral descriptions cannot be sorted into mutually exclusive categories strictly on the basis of level of marital adjustment, the happy couples were characteristically different from the therapy couples in their operational definitions of pleasant and unpleasant behaviors and intervals. For happy couples, a rating of pleasant interaction was usually associated with the presentation or commission of positive behaviors by the spouse. For therapy couples, a pleasant rating was usually associated with the omission of negative behavior that had been expected (*e.g.*, "she didn't gripe at my coming home late, for a change"). Many of the therapy couples rated the lack of an argument or the absence of embittered silences as relatively pleasant for them. Again, this was in sharp contrast to the happy couples who generally listed positive behaviors during the mutually pleasant interaction intervals.

Conversely, many of the unpleasant interactions described by the happy couples involved the omission of positive behaviors (*e.g.*, "could have talked to me more, showed affection"). In contrast, many of the unpleasant behaviors described by the therapy couples involved the commission of aversive behaviors. It should be emphasized that these positive and negative omissions and commissions often occurred simultaneously. The joint occurrence of these behaviors is illustrated by the lament of one of the distressed wives: "Overlooked the work I did, and picked up on the one thing I didn't do." The omission of a positive and the commission of a negative apparently had a double negative impact on the recipient.

DISCUSSION

The present study has shown that the Time Lines can distinguish between happy and distressed couples on four dimensions of marital interaction: the quantity of dyadic interaction, the quality of the interaction intervals, the ratio of positive time to negative time, and the degree of husband-wife agreement as to quality of time together. Used in conjunction with the Time Lines, the Daily Rating Scale also discriminated the happy from the distressed couples. The Time Lines were found to be only minimally reactive in that the pre-post MAS scores did not increase or decrease significantly, although husband-wife concordance did improve significantly. The MCS (response bias) scores showed some change in both happy and distressed husbands, with scores decreasing and increasing, respectively; wives' MCS scores were unchanged. Finally, it appears that the Time Lines offer a new perspective on the qualitative analysis of marital interaction.

Furthermore, this study suggests that neither the quantity nor the quality of marital interaction is primarily determined by "chance." Rather, a systematic relationship exists between the portion of available time that couples spend together and the quality of their interaction. The data also suggest that marital satisfaction is not a linear function of the amount of time together.

While the quality of dyadic interaction is believed to affect quantity (*e.g.*, aversive or negative interactions may result in avoidance by one or both partners), so, too, the quantity of interaction is believed to affect the quality (*e.g.*, content analysis of daily reports suggested that some of the couples had a threshold of time they needed to be together before they were able to communicate well and have positive exchanges). Although the relationship between quality and quantity of dyadic interaction is complex, it is systematic, not random. Furthermore, while each dynamically affects the other, *i.e.*, quality influences the amount of time together

and the amount of time time spent together affects the quality, they both affect marital satisfaction.

The qualitative data also suggests that there is a continuum of interactions between spouses, at each point on which both positive and negative interactions occur. A separate dimension of this continuum is the distinction between *committed* and *omitted* behaviors. Thus, at one end of the spectrum lie the ideally happy couples characterized by the most pleasant interactions in which most positive behaviors are committed and most negative behaviors are omitted. The distressed couples at the other end of the spectrum are characterized by the most unpleasant interactions in which most positive behaviors are omitted and most negative behaviors are committed. This study suggests that dyadic interactions are arranged along this continuum with none of the four types of behavior completely absent from any relationship, so that the level of marital satisfaction is a function of the prevalence of each type of behavior.

In order to increase the level of marital satisfaction, Weiss (1978) has suggested that it is necessary, but not sufficient, to decrease the couple's negative interaction through marital therapy. In order to strengthen the pair-bond, the positive interaction must concurrently be increased (Weiss, 1978, p. 199). The present data support this view and predict that the operational definitions of what constitutes pleasant and unpleasant interaction will change as the couple progresses in marital therapy. Thus, the cessation of aversive behaviors will be insufficient and the distressed couple will probably begin to report discontent with the omission of more pleasant interaction. In summary, this point may be illustrated by the following analogy: curing the marital relationship which is "diseased" by an excess of negative exchanges may not be sufficient, if the relationship also suffers from "malnutrition," *i.e.*, a deficit of positive and an excess of neutral interactions.

Finally, it is suggested that the expected be-

haviors which do not occur (*i.e.*, the omissions) may warrant equal consideration both in therapy and in research to the positive and negative behaviors which do occur (*i.e.*, the commissions).

Limitations

The limitations of the current research include the small number of couples in each group and the fact that the couples were restricted to the 20- to 30-year age range. A larger, more representative sample is needed before any statements can be made as to the generalizability of the findings. Furthermore, this preliminary study of the use of the time-line format did not undertake a formal analysis of the content of the functional behaviors. Reliability of the categories generated in the qualitative data needs to be determined.

Regarding the use of the Time Line, further data are needed to decide whether a 14-day recording period is the most efficient length for data collection. The time-line diary, as a self-report procedure, is strengthened by the corroboration of spouse-recording. However, as with all self-report instruments, the time lines are vulnerable to inaccuracies and distortion.

Speculation

The final theoretical implication these data have for understanding how marital relationships function is speculative. The following formulation reconciles the reciprocity theory of contingent behavior exchange (Azrin *et al.*, 1973; Patterson and Reid, 1970; Stuart, 1969) with the "bank account" theory of noncontingent or "unlatched" behavior exchange (Gottman *et al.*, 1976).

This formulation asserts that dyadic interactions are arranged along the following continuum, based on the prevalence of the behaviors committed and omitted:

noncontingent contingent contingent noncontingent
positives positives negatives negatives

The ratio of positive to negative interactions is maximum at the noncontingent positives end

of the continuum where approval, attention, and affection are exchanged freely and at high rates without regard to specific positive behaviors expected or received from the partner. In the terminology of Gottman *et al.* (1976) the "positive codes" or deposits in the bank account are more than adequate to cover any "negative codes" or withdrawals. They suggest: "It is precisely this lack of contingency in positive interaction that characterizes satisfying and stable nondistressed marriages" (p. xviii).

This noncontingent model is supported in this study by data from five very happy, well-satisfied couples. These couples had been married an average of 30 months, yet might still be described as "honeymooners." For these couples, the pleasant rating is apparently not contingent on a particular behavior, situation, or location. Instead, the spouse's presence is positive, both as a conditioned stimulus paired with previously enjoyed interactions and as a discriminative stimulus signalling increased opportunity for future pleasant exchanges. Regarding the daily recording procedure, one of the happy husbands suggested the following: "Forms should reflect that pleasant time together may be because (the partners) like *being* together and not that a certain act made this a pleasant time." The mean of the positive:negative ratios for this group was 104.5:1.

The subgroup of five couples with the next highest positive:negative ratios on the continuum were characterized by contingent positives or positive reciprocity. The positive:negative ratios for this group averaged 69.4:1, although this average was heavily skewed by one husband who refused to consider *any* time negative. (Without his ratio, the average for the group was 21.6:1.) The happy couples in this subgroup cited specific positive behaviors as directly influencing their marital satisfaction at a given time (*e.g.*, "he fixed dinner"). The couples recorded rates of positive behavior higher than the therapy couples but lower than the very happy couples. Yet, the rate of positives was low enough so that, if an expected positive was

omitted, it was noted on the daily recording form ("he didn't help me out with daughter when I was on the phone").

The six contingent negative couples are perhaps best illustrated by one distressed young couple: every time he drank, she nagged him about drinking. There was no occasion that he drank that she missed the opportunity to punish him for it. In this subgroup, the triggering stimulus is the specific behavior that the partner retaliates against. The average positive:negative ratio for this subgroup was 14.8:1.

The last subgroup is at the negative extreme of the continuum and is characterized by the commission of noncontingent negative behaviors. Rather than reciprocating negatives, one-for-one, these couples respond negatively to the partner's presence, regardless of his or her behavior. A frequently heard lament is the complaint by the wayward-husband-who-has-reformed that his wife is vindictive whenever she sees him, no matter what he does. His efforts at becoming a "better father" and a "more responsive husband" are often short-lived, since his attempts are uniformly punished by her negative response to his presence. The four couples in this study who were bordering on this type of disequilibrium had average positive:negative ratios of 4.5:1. The one wife who asked for a divorce had a ratio of 1 positive to 3.4 negatives. The husband, who left the study (and his marriage) after 3 days reported that there had been zero positive interactions, 10 hours 45 min of neutral interaction, and 5 hours 30 min of negative interaction over the 3 days. Using Gottman's bank account model of noncontingent interaction, these relationships are overdrawn, if not bankrupt. Like the noncontingent positive condition, the noncontingent negative condition involves a response to the spouse's presence rather than to his or her behavior. The spouse's presence serves as a conditioned stimulus paired with previously painful or aversive interactions and as a discriminative stimulus signalling increased opportunity for retaliatory or vengeful behavior.

In summary, it is postulated that when relatively high rates of either positive or negative behaviors are exchanged, they are emitted noncontingently. The lower rates of both positive and negative behaviors are tracked and exchanged at comparable rates. Although there is some evidence to suggest that both positive and negative reciprocity are contingent in the case of certain behaviors (e.g., when she buys a dress, he always screams about money), there seems to be insufficient evidence to postulate that all exchanges at this level are *quid pro quo*. For the higher rates of positive and negative interaction, the triggering stimulus appears to be the partner's presence. For the lower rates of positive and negative interaction, the stimulus appears to be the partner's behavior, although not necessarily the most proximate behavior! Furthermore, the triggering stimulus may have been an expected behavior which did not occur but which was conspicuous by its absence. The empirical testing of this model awaits future research.

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