



Communication of Affect between Patient and Physician

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Journal of Health and Social Behavior, Vol. 22, No. 1. (Mar., 1981), pp. 18-30.

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Communication of Affect between Patient and Physician

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Journal of Health and Social Behavior 1981, Vol. 22 (March):18-30

The purpose of this research was to identify patterns of patient-provider communication, in particular combinations of verbal and nonverbal (vocal) expression during the medical visit, that are associated with patient contentment with the visit and appointment-keeping. The data used in the analyses were tape recordings of 50 patient-physician interactions during routine medical visits for chronic disease. The interactions, which were rated by 144 judges, were assessed in three conditions: electronically filtered speech (voice only), original speech (voice and words), and transcripts (words only). Among the affective aspects rated were anger, anxiety, dominance, sympathy, assertiveness, and businesslike manner.

Findings indicate that the patient's contentment with the medical visit is related to the ratings of the physician's communication, but that the relationship for the physician's verbal communication is opposite that for the physician's nonverbal communication. When the physician sounds (in filtered speech) more negative—more angry, more anxious, and less as though the patient would return—the patients are more content. But when the physician utters words (judged in transcripts) that are less anxious and more sympathetic, patients are more content. The patient's return for subsequent appointments is also associated with the physician's expression of anger and anxiety in original (unfiltered) speech. Patients who return for appointments express mixed affects in the different conditions—more satisfied and less anxious in words and original speech, but less satisfied in voice tone. Since affect, in this study, appears to be reciprocated, we suggest that negative physician affect expressed in voice tone with positive affect communicated through words is interpreted by patients in an overall positive manner, as probably reflecting perceived seriousness and concern on the part of the physician.

Medicine is an art whose magic and creative ability have long been recognized as residing in the interpersonal aspects of the patient-

physician relationship. That relationship, frequently referred to in its idealized state, has only recently attracted the attention of social scientists investigating its precise nature, critical factors, and behavioral consequences (DiMatteo, 1979; Friedman, 1979b). Empirical studies have established that patients often judge the quality of their physician's interpersonal effectiveness, or the physician's "bedside manner," as a major indicator of general competence (Fisher, 1971; Ware and Snyder, 1975). Indeed, it is the judgment of the physician's ability to relate to patients in a warm, sympathetic, and personal manner that is often cited as the leading factor in a patient's con-

This research was funded by biomedical research support grants from the National Institutes of Health to The Johns Hopkins University; and by grants from the W. K. Kellogg Foundation, the Hospital Research and Educational Trust of the American Hospital Association, and the School of Public Health, University of Massachusetts, Amherst. The authors are grateful to Susan Larson and Carol Hess for their assistance.

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tinuance of treatment, compliance with recommendations, and satisfaction with the medical visit (Ben-Sira, 1980; Cobb, 1958; Davis, 1968; Freeman et al., 1971; Kasteler et al., 1976; Korsch et al., 1968).

The belief that a critical component of patient-physician interaction is not only what is said but how it is said stimulated the present research. The purpose of the study was to identify patterns of patient-provider communication, in combinations of verbal and nonverbal (vocal) expression during the medical visit, that are associated with patient contentment and appointment-keeping. To this end we examined physicians' and patients' spoken communications, through ratings of affect in transcripts, tape recordings, and filtered tape recordings. All three of these conditions can contain emotional information, even the transcripts of a communication, which express the literal content of the interaction. The tape recording expresses not only the literal (verbal) content but also the paralinguistic, or nonverbal, content, and filtered tape recordings are electronically altered tapes that allow the verbal content to be disguised so that only the tone of voice remains.

In the conduct of earlier research on vocal affect, two major difficulties have been observed (Kramer, 1964; Milmoie et al., 1967). The first is a dependence on data from experiments in which subjects simulate expressions of emotion rather than engage in spontaneous speech. The second difficulty is the weakness of the other variables with which affect measures have been correlated. We have sought to avoid these weaknesses by using audiotapes of patient-physician interaction during routine medical visits as the source of affective cues—a highly naturalistic data base, and by undertaking to discover some of the relationships between interpersonal affect and two very different measures of patient outcome—contentment with the visit (self-reported) and compliance with scheduled appointments (obtained from appointment records).

The present study deals with qualitative aspects of the interaction, such as perceived anger and anxiety, rather than quantitative or nonaffective aspects, such as amount of information provided or number of questions asked. Nonverbal communication via voice tone cues has been shown to yield rich information about

emotional states (e.g., Davitz, 1964), intent to persuade (Mehrabian and Williams, 1969), actual persuasion (Miller et al., 1976), and interpersonal orientations such as assertiveness and dominance (Bugental et al., 1976; Rosenthal et al., 1979). In the health domain, one study has shown that physicians' voice tone when they were talking about alcoholics was related to their effectiveness with alcoholic patients (Milmoie et al., 1967). Both the Bugental et al. (1976) and the Milmoie et al. (1967) studies indicated the usefulness of comparing voice tone with the affective content of the words that are uttered. Both studies also demonstrated that the impressions of naive judges can have considerable validity. Our study also relies on such impressions, because we wish to generalize about the kinds of interpersonal perceptions that physicians and patients might have of each other. Ratings by experts or measurements of vocal attributes by machine might not be as successful in capturing the phenomenological aspects of the interaction as judges registering their global impression.

In the present study, the patient's and physician's utterances were sampled and rated by separate groups of judges in the three conditions of electronically filtered speech, original speech, and transcript. A number of rating scales were used: anger, anxiety, sympathy, and likelihood that patient will return for next scheduled appointment (both patient and physician); satisfaction and assertiveness (patient only); and dominance and businesslikeness (physician only).

In addition to relating qualitative aspects of the patient-physician interaction to the outcomes of patient contentment and rate of appointment-keeping, we are also interested in the intercorrelations among the scales and among the three conditions of communication; in whether contentment and compliance are related; in whether the verbal and nonverbal affect of one party appears to influence the verbal and nonverbal affect of the other party; and in the relative importance of the words as opposed to voice tone in such affective influence. All of these questions have potential relevance for the conduct of physician-patient relations.

The interpersonal interactions that constituted the primary data of this study were gathered by Roter (1977a, 1977b) in the context

of an intervention study designed to increase question-asking by patients during their medical interview. The results of that intervention—as well as further details on the population and the setting, and on the gathering of patients' questionnaires and compliance data—can be found in Roter (1977a, 1977b).

METHOD

Sample

Subjects were 50 patients who visited a family and community health center outpatient clinic in East Baltimore, Maryland, and interacted with one of two female physicians. These 50 patients were randomly selected from 158 who were audiotaped in Roter's (1977a) study.¹ The data employed were the audiotaped interactions between these patients and their physician, plus questionnaires and archival data (see below). The population served by the facility is largely poor, female, and black. In the sample, the mean income was under \$6,000 a year; the mean education was about 10 years; the mean age was 43; 39 were women; and 42 were black. Most study participants had chronic diseases, mainly hypertension or diabetes. Two female physicians took part in the study; both were full-time and salaried by the health center. Most of the patients were well known by their physicians, the average length of attendance being greater than six months. Continuity of care is maintained by the clinic whenever possible, and patients generally see their assigned physicians for both scheduled and walk-in visits.

Judges

We used 144 judges, mainly undergraduates with a few graduate students, majoring in a variety of subjects, half male and half female, to rate the patient-physician interactions. Half of the judging was done at The Johns Hopkins University and half at the University of Massachusetts, Amherst. Judges were recruited via posters and word-of-mouth on the campuses and were paid \$5.00 for a 2-hour session. They received no special training, since the goal was to obtain the impressions of naive raters. No selection procedure was followed except to ascertain the prospective judge's willingness to undertake the task.

Stimuli

Original-condition tapes. For the patient and physician in each interview, we selected a short clip of speech from close to the exact middle of the first one-third, the middle of the second one-third, and the middle of the last one-third of the interview, for a total of three clips from each participant. This sampling method was used in order to reduce to an absolute minimum any bias in choosing clips, while keeping constant the temporal occurrence of the clips from speaker to speaker. We attempted to choose clips that were at least 10 seconds long and that represented complete statements. However, this goal could not always be achieved, mainly owing to the constraints imposed by the method of selecting clips from the middle of each third of the interview. The length of the utterances varied from 3 to over 100 words, with a mean of 21 words for the patient ($SD = 15$) and of 33 words for the physician ($SD = 22$). Separate tapes were made containing patient clips and physician clips. For each individual, the order of her/his three clips (early, middle, late) was randomly determined. The order of the interviews on the tape was also randomly determined. The resulting tapes contained 150 physician clips (50 interviews \times 3 clips) and 149 patient clips (for one patient, only two clips were available). Each clip was identified by a recorded sequence number and was followed by a 4-second rating pause.

Filtered tapes. The original-condition speech clips, described above, were made unintelligible by means of an electronic bandpass filter device (Rovoco Model 104),² which removes specified frequency bands from the speech signal. The resulting filtered speech is sufficiently muffled that words cannot be understood, but expressive features, such as intonation contour, speed, and rhythm, remain.

Transcripts. Transcripts were prepared containing the verbal content of the clips recorded on the edited patient and provider tapes. Since the tape recording contained natural speech, the utterances included many pauses, ungrammatical statements, and questions, as well as an occasional incomprehensible phrase. An attempt was made to represent these elements exactly in the transcripts. Examples of the actual utterances are:

I can't do nothing else. I mean if I walk a block I've got to stop before . . . (patient)

Okay, well, I told you I wanted to get well. I mean to say . . . fool around. It didn't make any . . . come'n to the doctor and then don't do what they say. (patient)

Well, some places it's convenient and I can do so. Some places it's too much of a crowd. I mean, you know, you can't get there like you want to. So I have to just bear with it and take it when I come home. (patient)

I want to examine you. Get on the table, okay? I know it is hard for you to be dressing and undressing, but you know I have to examine you again, okay? (physician)

No, no. This one. A hundred of this, because you'll get it every day but this only once a day. Once a week, I mean. Okay. How 'bout the cramp medicine, do you need that? (physician)

Do you still take the pills for dizziness? (physician)

Rating Scales

Eight different rating scales were used. Each went from "low" to "high" and had nine numbered scale points. The affective dimensions rated were selected on grounds of prior use in comparable research (Hall and Levin, in press; Milmoie et al., 1967) and for their face validity in the physician-patient context. Both the patients and the physicians were rated on four of the scales—angry/irritated, sympathetic/kind, anxious/nervous, and probability that patient will return for next appointment. Only the patients were rated on the assertive/self-confident and satisfied/pleased scales, and only the physicians were rated on the dominant/controlling and businesslike/matter-of-fact scales. Each rating booklet contained space for the rating of 150 clips (all the patient clips or all the physician clips) on one rating scale. As in most studies employing global ratings by naive judges, these judges received no special instructions on the precise operational meanings of the rating scales. They were instructed, however, on the use of rating scales in general.

Procedure

Each judge rated all of the physician clips and all of the patient clips (with the order

counterbalanced) in one condition. Each judge rated the physician clips on one randomly determined rating scale and rated the patient clips on an independently and randomly determined rating scale. Judges did their ratings in groups of varying sizes, depending on ease of scheduling. For each group, the condition (original, filtered, or transcript) was determined randomly ahead of time. The edited tapes and transcripts were divided into blocks of thirds, and these blocks were administered in counterbalanced sequence in the different groups to help rule out order effects in the ratings. The two tape conditions took approximately two hours each to rate, and the transcript condition took about one and one-half hours. To summarize, each judge rated all patient clips in one condition on one randomly determined rating scale, and also rated all physician clips in the same condition on one independently and randomly assigned rating scale. Thus each rating scale was applied by either three or six different groups of judges, and eight judges (four male and four female) rated each condition-by-scale-by-speaker combination (e.g., filtered, satisfied, patient).

Other Patient Variables

Data on two other scales were gathered directly from the patients by Roter (1977a). These were: (1) a seven-item attitudes-toward-physicians scale ($\alpha = .76$), and (2) a six-item patient-contentment scale ($\alpha = .67$), not to be confused with the ratings of patient satisfaction described above.³ The reliabilities cited are from Roter (1977a). Examples of items in the two scales are: "Sometimes doctors ignore people's feelings" (attitudes toward physicians) and "How well was your doctor able to relieve your worries about your illness?" (contentment).

In addition, two measures of patient compliance were gathered by Roter (1977a). The first was an appointment-keeping index for the four months preceding the visit, computed by dividing the number of appointments kept over that four months by the number made during that period. The second was an appointment-keeping index for the following four months, computed in the same way. Since the patients generally had an ongoing relationship with the same physicians, the past appointments and

the subsequent appointments were with the same physician in almost every case.

There were some missing observations for these four patient variables, as the tables indicate.

RESULTS

Inter-judge Reliability

Inter-judge reliability was assessed by computing a coefficient of internal consistency (alpha) for each group of eight raters judging a condition-by-scale-by-speaker combination. Since there was not much variation between the reliabilities of early, middle, and late clips, Table 1 shows only the median reliabilities across the early, middle, and late clips. The reliabilities for patient clips are somewhat higher on the average than for physician clips, probably reflecting the fact that, in general, patient ratings had higher variances than physician ratings. This finding is to be expected, because 50 different patients would be likely to vary more than two physicians, even though those two were interacting with 50 different patients. Table 1 shows that transcript was rated most reliably, followed by original speech and filtered speech.

Intercorrelations among Rating Scales

Table 2 shows the correlations among the rating scales for patients and for physicians. (All tests in this paper are two-tailed.) Because the pattern and magnitude of correlations tended to be very similar in the three conditions (transcript, original, and filtered), the table summarizes the data by showing the me-

dian correlation across the three conditions. In this and all following tables, the early, middle, and late clips were summed before the correlations were computed, in order to increase further the reliability of the mean ratings. Combining the three clips in this way was justified because the early, middle, and late clips had median intercorrelations that were virtually all positive, indicating consistency in the individuals' affect over the course of the interview. Not surprisingly, the three clips showed similar relationships to other variables.

Table 2 shows a number of predictable relationships—for example, negative correlations between sympathetic and angry ratings—as well as several that are less expected. Anger and anxiety are substantially related to each other for both participants, even though the clips were rated on these scales by different groups of judges. Similarly, physician's anger and dominance are appreciably related, as are patient's anger and assertiveness. These positive correlations suggest the possibility that anxiety, dominance, and assertiveness are all easily confused with anger, from which they are conceptually quite distinct. If so, the patients and physicians who are trying to express those feelings and who do not feel especially angry may often be perceived, nevertheless, as angry—with imaginable consequences for their interpersonal interaction.

Intercorrelations among Conditions

Examination of the correlations among the three conditions—original speech, filtered speech, and transcript—can indicate redun-

TABLE 1. Inter-judge Reliabilities (alpha) for Patient and Physician

| Scale | Patient | | | Physician | | |
|-----------------------|------------|----------|----------|------------|----------|----------|
| | Transcript | Original | Filtered | Transcript | Original | Filtered |
| Angry | .76 | .82 | .49 | .66 | .60 | .62 |
| Anxious | .85 | .69 | .51 | .60 | .25 | .62 |
| Sympathetic | .59 | .52 | .53 | .41 | .54 | .43 |
| Probability of return | .76 | .45 | .22 | .56 | .36 | .13 |
| Satisfied | .69 | .51 | .41 | — | — | — |
| Assertive | .69 | .77 | .46 | — | — | — |
| Dominant | — | — | — | .52 | .59 | .51 |
| Businesslike | — | — | — | .49 | .46 | .22 |
| Mean reliability | .72 | .63 | .44 | .54 | .47 | .42 |

TABLE 2. Intercorrelations of Ratings for Patients and for Physicians

| Scale | Angry | Anxious | Sympathetic | Probability of Return | Satisfied (Dominant) | Assertive (Businesslike) |
|--------------------------|--------|---------|-------------|-----------------------|----------------------|--------------------------|
| Angry | — | .60*** | -.41** | -.33* | -.49*** | .39** |
| Anxious | .64*** | — | -.36* | -.06 | -.65*** | -.01 |
| Sympathetic | -.39** | -.37** | — | .53*** | .36** | -.44** |
| Probability of return | .02 | -.32* | .35* | — | .33* | -.31* |
| Satisfied (Dominant) | .54*** | .42** | -.32* | -.13 | — | -.18 |
| Assertive (Businesslike) | -.38** | -.36** | .15 | .04 | -.15 | — |

Note: Correlations for patient ratings are above the diagonal, for physician ratings below the diagonal. "Satisfied" and "assertive" apply only to patients; "dominant" and "businesslike" apply only to physicians. Each entry is the median of the correlations obtained in the three conditions (transcript, original, and filtered).

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

dancy, or lack of it, in the three channels of communication. These correlations were examined for each rating scale and speaker (for instance, the correlation between transcript anger and filtered-speech anger for the patients). Results show little redundancy; furthermore, only those conditions that share some information have some degree of positive correlation with each other. More specifically, the conditions that share the verbal content (transcript and original speech) tend to be slightly positively correlated (median $r = .14$; range = .01 to .43); and the conditions that share the vocal qualities (filtered and original speech) are substantially positively correlated with each other (median $r = .48$, $p < .001$; range = .22 to .74), 11 of the 12 scale-by-speaker combinations showing significant positive correlations. By contrast, the two conditions that share no content (transcript and filtered speech) show no relationship on the average (median $r = .05$; range = $-.21$ to $.32$); only for two scales are the transcript and filtered conditions significantly related (patient anger, $r = .32$, $p < .05$; physician dominance, $r = .30$, $p < .05$). Thus patient's anger and physician's dominance are expressed through both words and voice tone, but the other kinds of affect seem to be expressed through one channel or the other, but not both at once.

It can be concluded from the above that all three conditions carry unique information, but the stronger correlation of original speech with filtered speech than with transcript indicates that when rating original speech, the judges were much more influenced by the nonverbal vocal qualities than by the words alone.

Relationship of Physician Communications to Patient Communications

In these analyses the ratings of the physician's and the patient's communications were correlated. Though the present study is nonexperimental, it is possible to interpret cautiously any correlations between the two participants' communications as reflecting the impact of one on the other. There is no way to be certain, of course, that a correlation between a patient variable and a physician variable is not caused by an unmeasured third variable, and one cannot determine who is influencing whom. Nevertheless, it is still of interest to uncover evidence that the participants might be responding to each other in systematic ways, especially through the nonverbal communication channel.

Analysis of ratings. This analysis shows that there are more than twice as many correlations significant at the $p \leq .05$ level as one would expect by chance; out of 324 correlations (6 patient scales by 6 physician scales by 3 patient conditions by 3 physician conditions), 38 are significant, whereas only 16 would be expected under the null hypothesis. Twenty-one of the significant correlations provide evidence for *reciprocation of similar affect* between the participants, as demonstrated by the following: (1) "positive reciprocation": the patient's sympathy, probability of return, or satisfaction is positively correlated with the physician's sympathy or probability of patient's return (median $r = .39$); (2) "negative reciprocation": the patient's anger or anxiety is positively cor-

related with the physician's anger or anxiety (median $r = .33$); (3) "complementary reciprocation": one participant's sympathy, probability of return, or the patient's satisfaction is negatively correlated with the other's anger or anxiety (median $r = -.34$). Only 3 of the 24 correlations involving the scales just named do *not* show these apparent reciprocation effects.

An additional pattern shows that greater physician dominance is associated with greater patient negativity, as reflected in the patient scales for anger, anxiety, sympathy, probability of return, and satisfaction (seven significant correlations, median $r = .35$). Only one correlation involving the just-named scales does not show this pattern. Table 2 shows, however, that physician anger and dominance are substantially related, so this pattern may indicate more of the reciprocation-of-similar-affect phenomenon described above. Similarly, when the physicians are more businesslike, which is negatively correlated with physician anger, the patients are more sympathetic and less anxious; again, this may be reciprocation. But the correlation of .49 ($p < .001$) between the physician's businesslike voice tone and the patient's transcript assertiveness suggests something other than simple reciprocation, especially since assertiveness is negatively related to patient's sympathy—it suggests that a more businesslike manner encourages patient self-confidence in the form of verbal assertiveness. Of course it is also possible that verbally assertive patients inspire a businesslike manner in their providers.

Analysis of conditions. This analysis reveals that the 38 significant correlations between patient and physician communications are not evenly distributed over conditions, as Table 3 shows. There is no instance of reciprocation or any apparent mutual responsiveness when both participants are rated in original speech or

in transcript, and in general one participant's transcript is poorly related to the other's affect in any condition. But when the conditions containing voice tone (filtered and original speech) are looked at, one sees that there is a disproportionately large number of significant correlations—especially for physician's filtered speech.

The data in Table 3 were subjected to a statistical test to determine if there was a reliable tendency for the number of significant correlations to be greater when the communication was more nonverbal in nature. We ranked the nine cells of Table 3 into six categories reflecting the presence of nonverbal cues, on a dimension that went from none to many, as follows: (1) patient's transcript–physician's transcript, (2) patient's transcript–physician's original speech and patient's original speech–physician's transcript, (3) patient's original speech–physician's original speech, (4) patient's transcript–physician's filtered speech and patient's filtered speech–physician's transcript, (5) patient's original speech–physician's filtered speech and patient's filtered speech–physician's original speech, and (6) patient's filtered speech–physician's filtered speech. This is not the only ranking that is possible, but it is a very reasonable one, for it ranks the correlations based on transcript lower than those based on filtered speech, with original-speech correlations taking intermediate positions. This ranking was then correlated with the number of significant correlations in the cells of Table 3, after averaging the numbers for categories (2), (4), and (5). The resulting correlation is .77 ($p < .05$), demonstrating what the eyeball examination suggests—that apparent affective responsiveness between the participants is increasingly likely as the communication channels judged become more nonverbal in nature. This pattern indicates that despite the fact that filtered-speech ratings show lower reliabilities than do ratings in the other conditions, the filtered-speech ratings are actually highly valid indicators of communicated affect. Fifteen of the 21 "reciprocated affect" correlations described earlier involve physician's filtered speech. We can infer from this that much of the affective communication that is actively responded to in the physician-patient interaction takes place via nonverbal cues. The physi-

TABLE 3. Number of Significant Correlations between Patient and Physician, by Condition

| Physician | Patient | | | Sum |
|------------|------------|----------|----------|-----|
| | Transcript | Original | Filtered | |
| Transcript | 0 | 7 | 3 | 10 |
| Original | 3 | 0 | 1 | 4 |
| Filtered | 4 | 9 | 11 | 24 |
| Sum | 7 | 16 | 15 | 38 |

cian's voice tone seems to be particularly consistently related to patient communications.

Intercorrelations among Other Patient Variables

In the sections that follow, the patient's contentment, attitudes toward physicians, and compliance are discussed in relation to the participants' communications. But before we proceed to such analyses, it is appropriate to discuss the relationships among these patient variables. Table 4, which contains this information, reveals that these variables tap different aspects of patients' attitudes and behaviors. Past and subsequent compliance tend to be positively related, suggesting that compliance with scheduled appointments is a somewhat reliable trait of this population. However, both of our compliance variables are based largely on a continuing patient relationship with one physician. We cannot infer that these patients would show consistent appointment-keeping if they had to visit different providers each time. The other intercorrelations are also positive but small, indicating that positive attitudes toward physicians, contentment, and compliance are weakly but positively related variables. We would expect positive but not necessarily large correlations, since the three variables (a general attitude measure, self-report of responses to a particular clinic visit, and behavioral measures for two different time periods) should each contain a substantial amount of independent unexplained variance.

Relationship of Patient and Physician Communications to Patient's Contentment and Compliance

The patient's contentment with the visit shows little relationship to ratings of the pa-

tient's own communications. Contentment is, however, related to ratings of the *physician's* communications, as Table 5 shows. This table shows results of two analyses: (1) zero-order correlations between contentment and physician ratings, and (2) standardized coefficients from regression analyses that employed as predictors the patient's attitudes-toward-physicians and health-locus-of-control scores,⁴ plus all of the patient and physician ratings for the given scale (e.g., patient's anxiety and physician's anxiety, each in all three conditions). As Tables 5 and 6 indicate, the two kinds of analysis parallel each other closely in results; even when every other relevant variable is controlled for, the regression coefficients are generally similar in pattern to the zero-order correlations. (In both tables, the only scales included are those that showed at least one significant relationship to the outcome variables.)

Table 5 shows that when physicians utter words (in transcript) that are less anxious and more sympathetic, patients report greater contentment with their visit. By itself this result is perhaps not surprising. However, the ratings of physician's vocal quality (filtered speech) show a very different pattern. Here, when physicians sound more *negative*—more angry, more anxious, and less as though the patient would return—the patients say they are more contented. In addition, when physicians are less businesslike in original speech, their patients are more contented; this result is consistent with the results for filtered speech, because businesslike ratings are negatively correlated with ratings of physician anger and anxiety (Table 2). Thus the verbal and nonverbal channels of communication show opposite relationships to patients' contentment.

Turning to the compliance measures, shown in Table 6, one sees that the past and sub-

TABLE 4. Intercorrelations among Patient Variables

| Patient Variable | Attitudes toward Physicians | Contentment with Visit | Past Compliance | Subsequent Compliance |
|-----------------------------|-----------------------------|------------------------|-----------------|-----------------------|
| Attitudes toward physicians | | .26 (36) | .20 (27) | .22 (33) |
| Contentment with visit | | | .18 (26) | .12 (30) |
| Past compliance | | | | .36 ⁺ (25) |

Note: Variables are scored so that a high score means favorable attitudes toward physicians, more contentment, and high past and subsequent compliance. Degrees of freedom are in parentheses.

⁺ $p \leq .10$.

TABLE 5. Correlations between Patient's Contentment and Physician Ratings

| Physician Rating | Zero-Order Correlation | Standardized Regression Coefficient |
|-----------------------|------------------------|-------------------------------------|
| <i>Transcript</i> | | |
| Anxious | -.33* (38) | -.43* (1, 25) |
| Sympathetic | .46** (38) | .32 ⁺ (1, 25) |
| <i>Original</i> | | |
| Businesslike | -.31* (38) | -.19 (1, 31) |
| <i>Filtered</i> | | |
| Angry | .37* (38) | .64* (1, 25) |
| Anxious | .32* (38) | .33 (1, 25) |
| Probability of return | -.14 (38) | -.34* (1, 26) |

Note: Degrees of freedom are in parentheses.

⁺ $p \leq .10$; * $p \leq .05$; ** $p \leq .01$.

sequent compliance correlations do not parallel each other exactly, though there are no strong contradictions; this lack of perfect agreement between the two compliance measures is not surprising, since past and subsequent compliance are not strongly correlated with each other (Table 4). Table 6 shows that the patient's past compliance is associated with more positive words spoken by the patient (less anxiety, more probability of return, and more satisfaction). The same pattern holds for the patient's original speech, and here less anxious and more satisfied speech ratings are related to subsequent compliance as well. Filtered speech, however, shows a significant

negative regression coefficient between satisfaction and past compliance; again, the verbal and vocal channels show different relationships with patient outcome. But unlike in Table 5, where patient contentment is predicted by positive verbal and negative nonverbal behavior by the physician, here such relationships exist between patients' affect and their own apparent concern for their health as reflected in appointment-keeping behavior.

The physician data shown in Table 6 are also consistent with Table 5, where more anger and anxiety in the physician's voice are associated with patient contentment. Here, more anger and anxiety in the physician's original speech are related to better compliance. In addition, where physicians are more dominant in their original speech, their patients have better past compliance.

DISCUSSION

The purpose of this research was to obtain ratings of physicians' and patients' verbal and vocal affect during actual clinic visits, and to relate those ratings to each other and to the patient variables of contentment with the visit and appointment-keeping record. Such a study, being nonexperimental, can indicate relationships of theoretical and practical importance, but does not allow one to infer causal relations among variables. An additional limi-

TABLE 6. Correlations between Compliance and Patient and Physician Ratings

| Rating | Past Compliance | | Subsequent Compliance | |
|-----------------------|------------------------|-------------------------------------|------------------------|-------------------------------------|
| | Zero-Order Correlation | Standardized Regression Coefficient | Zero-Order Correlation | Standardized Regression Coefficient |
| <i>Patient</i> | | | | |
| <i>Transcript</i> | | | | |
| Anxious | -.12 (27) | -.60* (1, 16) | .02 (32) | .12 (1, 20) |
| Probability of return | .32 ⁺ (27) | .54* (1, 16) | .12 (32) | .19 (1, 21) |
| Satisfied | .26 (27) | .46* (1, 19) | .01 (32) | -.17 (1, 23) |
| <i>Original</i> | | | | |
| Anxious | -.21 (28) | -.17 (1, 16) | -.38* (33) | -.59** (1, 20) |
| Satisfied | .27 (28) | .88*** (1, 19) | .32 ⁺ (33) | .53* (1, 23) |
| <i>Filtered</i> | | | | |
| Satisfied | -.10 (28) | -.65** (1, 19) | .08 (33) | -.19 (1, 23) |
| <i>Physician</i> | | | | |
| <i>Original</i> | | | | |
| Angry | .26 (28) | .22 (1, 16) | .33* (34) | .35 (1, 20) |
| Anxious | .28 (28) | .42 ⁺ (1, 16) | .27 (34) | .43* (1, 20) |
| Dominant | .31 ⁺ (28) | .69** (1, 20) | -.04 (34) | -.12 (1, 25) |

Note: Degrees of freedom are in parentheses.

⁺ $p \leq .10$; * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

tation of the present research, one that is shared with much field research that is conducted in a few sites such as schools or hospitals, is that generalizations must be limited to the population sampled. In our case, the population is mainly black, low-income female clinic patients, attending a community and family clinic in a major U.S. city. Similarly, because there are only two physicians, both of one sex, we cannot make inferences about the behavior of physicians in general. We cannot say, for example, that the mean level of anger in the voices of these physicians is typical of that found in other physicians, either at this site or elsewhere. Fortunately, the main purpose of the present research is not to make such generalizations but, rather, to assess covariation of the physicians' behavior with patient variables obtained in 50 independent interviews. Thus an appropriate and less limiting inference can be made about patients in clinic interviews, since the 50 different patients ensure the independence of the sampling units involved. Nevertheless, it must be stressed that the generality of the results of this study will have to be demonstrated in further research.

Several of our results have potential significance for our understanding of physician-patient relations. First, judges did not distinguish well between anger and anxiety (and to a lesser extent between anger and the affects of dominance and assertiveness). If the naive judges were, as we intended, registering valid impressions of the affects they perceived, then we must infer that the original interactants could also have been confused in the same way. Obviously, for a physician to mistake a nervous patient for an angry one (as an example) could be very bad for their transaction, especially in light of the tendency to reciprocate similar affects, which was also apparent in this study. It would be interesting to see if the same pattern of scale intercorrelations would be obtained if judges also could see the participants' facial expressions, hand gestures, and body postures.

The second result of practical as well as theoretical significance pertains to the correlations among the three rating conditions of transcript, original speech, and filtered speech. It was shown that ratings in the three conditions were not generally extremely high, indicating

that each condition offers unique information about emotion. However, a clear pattern suggested that impressions of original, unfiltered speech were a function more of vocal quality than of the actual words. We would infer that in actual face-to-face encounters, the words contribute little to one's overall impressions of the other's affect. Of course, the words that people utter contain much *besides* affect. Physicians' words convey facts, advice, questions, and opinions, all of which may have a critical impact on the patient's impression of the physician's expertise and credibility, and on the patient's retention of health-relevant knowledge and subsequent compliance. Two important questions, therefore, are the relationship between affective and nonaffective elements and their relative impact in the clinic situation. It is important to know whether there is a positive relationship or a trade-off between physicians' supportive manner and their apparent (and actual) competence in clinical tasks, and how these two aspects of physician behavior—socioemotional versus task— influence the patient. This would seem to be the direction that research on doctor-patient interaction should take in the future.

Finally, patients' compliance and self-rated contentment showed intriguing relationships to the physicians' and to their own rated affect. Patients' contentment was related not to their own communications but to the physicians'. Physician transcripts revealed an association of positive physician affect with greater contentment. In physicians' filtered speech, however, their negative affect was associated with greater contentment. Reassuring and positive words and an angry or anxious tone in the physician appear to be related to patients' positive feelings upon leaving. Since the physicians' transcript and voice tone were uncorrelated for the scales in question, these two effects are independent and therefore not two expressions of the same relationship. These results mean that on the average it was the simultaneous combination of the positive and negative affect cues that pleased patients most.

One interpretation of this effect is suggested by two previous studies. Friedman (1979a) studied affect cues from photographs of facial expressions that were paired with scripts of statements supposedly made by the persons in the photographs. Friedman concluded that

when negative faces (i.e., negative nonverbal cues) were paired with positive statements (i.e., positive verbal cues), it was likely that the "unsaid message" was a strong task orientation. Since ratings of businesslike manner were negatively correlated with anger and anxiety in our study, it is not inconsistent to think that the combination of negative nonverbal and positive verbal cues would also have yielded the impression of a task orientation and that this was viewed favorably by patients.

Woolfolk (1978), in a study on cues delivered through words, voice tone, and facial pleasantness by teachers, similarly found a strong effect of the combination of positive verbal and negative nonverbal cues. The most effective combination of cues for high student performance among sixth-grade students was positive verbal and negative nonverbal messages, and least effective was a negative verbal and positive nonverbal combination. Woolfolk suggests that the successful combination represents the operationalization of the "firm but fair" teacher whose words are supportive but whose nonverbal behavior communicates seriousness and control. Woolfolk further speculates that this combination also reflects an effective and assertive communication pattern, whereas negative words and positive nonverbal cues reflect an unassertive manner that is not taken seriously.

Based on these studies, we would conclude that the negative affect judged in the physicians' tone in combination with positive words was interpreted in an overall *positive* sense by patients as reflecting sincerity, concern, and a task orientation.

Davis (1968) concluded from a study in which a content analysis of patient-provider dialogue during medical visits was correlated to patient appointment-keeping that a measure of friendly rapport was not significantly correlated with patient compliance. Davis suggests that as the relationship between the doctor and patient becomes friendly, strains are created that interfere with role functions. It may be that patients' perceptions of physicians' friendliness and seriousness are sometimes at odds.

Both the patient satisfaction and the compliance literatures would agree that elements of the patient-physician relationship appear to

have the greatest effect on patient attitudes and behavior, but that these elements are difficult to define and even more difficult to measure. Expressions of warmth, personal concern, and interest, the provision of information and explanations, and a businesslike "expert" delivery appear to be related to both patient satisfaction and compliance (Davis, 1968; Fisher, 1971; Francis et al., 1969; Hulka et al., 1970; Kasteler et al., 1976; Korsch et al., 1968; Svarstad, 1974; Ware and Snyder, 1975). Our findings are consistent, and somewhat more precise. Interaction takes place in more than one communication channel, and it appears that the constellation of effective physician attributes, such as sincerity, concern, task orientation, and perhaps assertiveness, may best be transmitted through the combination of positive words and negative voice tone.

The significance of these findings lies in the identification of patterns of patient-provider communication, in particular combinations of verbal and nonverbal expression during the medical visit, that are associated with patient contentment with the visit and appointment-keeping. The results of this study, although limited to a specific population and type of medical practice, suggest that the affective behavior of physicians, or the socioemotional aspects of care, may be more precisely defined through an analysis of spontaneous doctor-patient interaction, and that these patterns may be associated with subsequent patient attitudes and behavior.

A recent study by Ben-Sira (1980) presents empirical support for an often expressed hypothesis that the affective mode of physician behavior is judged by patients as the crucial component of the medical treatment. Ben-Sira suggests that particularly for lower-class patients, it is the affective mode of delivery that determines patients' assessment of the quality of the treatment and consequently determines patients' satisfaction. Our study suggests further that the affective component of physician behavior may be recognized from communication patterns and that these patterns are associated not only with contentment but with appointment-keeping as well.

The import of these findings is enhanced by increasing evidence that nonverbal communication skills can be taught (DiMatteo et al.,

1980; Haase et al., 1972; Rosenthal et al., 1979). Training physicians to be more aware of the verbal and nonverbal cues they transmit, and to be more sensitive to cues being sent to them has an obvious application in programs for medical and allied health professionals in schools, and as continuing education courses in a variety of settings. Likewise, these findings may have an application in patient and consumer health education programs. The teaching of effective communication patterns on the lay side of the doctor-patient interaction may be very useful to patients attempting to negotiate the medical care system, and would certainly be an addition to patient activation programs. The results of improved communication may have significance not only in treatment and prevention of illness but in other areas as well, with consequences for both patient and physician satisfaction. The doctor-patient relationship in general would benefit from improved communication, and some authors would maintain that enhancement of the relationship might serve to decrease the length and therefore the cost of a medical visit (DiMatteo et al., 1980). Furthermore, a better doctor-patient relationship might discourage malpractice suits and doctor-shopping (Friedman, 1979b; Kasteler et al., 1976).

NOTES

1. Half of the 50 were selected from the experimental condition, and half from the control condition, in Roter's (1977a) experiment on patients' question-asking. Analyses showed that there were almost no differences between the two conditions on the ratings gathered in the present study. Since the N's of the two conditions were too small to justify separate analyses, the two conditions were pooled in all the analyses reported here.
2. Available from Peter L. Rogers, 7 Donna Road, Chelmsford, MA 01824. This device is based on the one described in Rogers et al. (1971).
3. The contentment attitudes scale contained some items developed by Ware and Snyder (1975) and by Zyzanski et al. (1974).
4. Though not discussed elsewhere in this paper, patients' health locus of control was assessed using separate scales composed of internal items (alpha reliability = .72) and external items (alpha reliability = .64) of the Health Locus of Control Scale developed by Wallston et al. (1976). Further description of the scale analysis may be found in Roter, 1977a.

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