

Physician-Patient Communication in the Primary Care Office: A Systematic Review

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Background: The physician-patient interview is the key component of all health care, particularly of primary medical care. This review sought to evaluate existing primary-care-based research studies to determine which verbal and nonverbal behaviors on the part of the physician during the medical encounter have been linked in empirical studies with favorable patient outcomes.

Methods: We reviewed the literature from 1975 to 2000 for studies of office interactions between primary care physicians and patients that evaluated these interactions empirically using neutral observers who coded observed encounters, videotapes, or audiotapes. Each study was reviewed for the quality of the methods and to find statistically significant relations between specific physician behaviors and patient outcomes. In examining nonverbal behaviors, because of a paucity of clinical outcome studies, outcomes were expanded to include associations with patient characteristics or subjective ratings of the interaction by observers.

Results: We found 14 studies of verbal communication and 8 studies of nonverbal communication that met inclusion criteria. Verbal behaviors positively associated with health outcomes included empathy, reassurance and support, various patient-centered questioning techniques, encounter length, history taking, explanations, both dominant and passive physician styles, positive reinforcement, humor, psychosocial talk, time in health education and information sharing, friendliness, courtesy, orienting the patient during examination, and summarization and clarification. Nonverbal behaviors positively associated with outcomes included head nodding, forward lean, direct body orientation, uncrossed legs and arms, arm symmetry, and less mutual gaze.

Conclusion: Existing research is limited because of lack of consensus of what to measure, conflicting findings, and relative lack of empirical studies (especially of nonverbal behavior). Nonetheless, medical educators should focus on teaching and reinforcing behaviors known to be facilitative, and to continue to understand further how physician behavior can enhance favorable patient outcomes, such as understanding and adherence to medical regimens and overall satisfaction. (J Am Board Fam Pract 2002;15: 25-38.)

The medical interview is a core clinical skill for all health care providers, but it seems to be especially important for primary care disciplines. An average generalist is estimated to conduct between 120,000 and 160,000 interviews during a 40-year profes-

sional career.¹ A communicative provider-patient relationship is especially important in the management of chronic diseases, such as diabetes, hypertension, coronary artery disease, and congestive heart failure.² When patients are informed and involved in decision making, they are more adherent to medical recommendations and carry out more health-related behavior change (eg, exercise, smoking cessation, and dietary modification).³ Such joint decision making requires patients to be fully informed about alternatives and potential risks of treatment,⁴ and to have trust in their physician.

Unfortunately, physician-patient communication has frequently been judged to be inadequate.^{5,6} McBride et al⁷ found that patients considered communication to be one of the top three competencies a physician should possess, yet they frequently rated their own physicians' communication skills to be unsatisfactory. These and related findings sug-

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gest the need for enhanced attention to communication skills in physician education and quality improvement in family practice. Such activities should be based on empirical data showing which aspects of physician behavior are critical to patient outcomes.

This review seeks to complement the efforts of other authors working in this area of research. Moira Stewart⁸ reviewed verbal communication patterns for different phases of a physician-patient encounter. Roter and Hall⁹ and Ong et al¹⁰ compared various coding systems, and Roter et al¹¹ reviewed the design and populations of verbal studies but did not concentrate on outcomes. No review to date has focused on outcome comparisons with individual behaviors or included both verbal and nonverbal interactions. The goal of this review, therefore, was to determine those specific verbal and nonverbal physician behaviors that are objectively measurable and have been linked in empirical studies with favorable patient outcomes using an evidence-based format.

Methods

To find relevant studies, the MEDLINE and PSYCINFO on-line databases for 1975–2000 were searched using the key words “physician-patient relationship,” “provider-patient relationship,” “doctor-patient relationship,” “verbal communication,” “nonverbal communication,” and “nonverbal behavior.” Bibliographic lists of all selected articles were searched for further references.

From the retrieved articles, studies were selected for inclusion if they met the following criteria:

1. It was an empirical study of office interactions between patients and primary care physicians. Psychiatrist-patient encounters were excluded, because their nature differs from that of primary care medical encounters.
2. Interactions were studied empirically using neutral observers who coded observed encounters, videotapes, or audiotapes.
3. Empirical (quantitative) measures were used to evaluate verbal and nonverbal behaviors.
4. Statistically significant associations were found between one or more discrete measure of communication and one or more care outcomes. Care outcomes included satisfaction, trust, rapport, comprehension, compliance and adherence, and long-term health effects (eg, glucose control). Few

studies were found that investigated the relation between nonverbal behaviors and care outcomes, so the outcome criteria for nonverbal studies were expanded to include associations between behaviors and either patient characteristics (eg, sex, anxiety, health status) or subjective ratings of the interaction (eg, dominance, affiliation).

5. Sample size was at least 10 encounters.
6. Study results were published in English.

A total of 14 studies of verbal communication and 8 studies of nonverbal communication met these inclusion criteria.

Each study meeting review inclusion criteria was systematically evaluated to determine the sample characteristics (setting, type of visit, patient and physician demographics), the specific verbal and nonverbal behaviors that were being measured, the patient-oriented outcomes for verbal studies and patient-oriented outcomes or patient characteristics for nonverbal studies, the measures of association between each provider behavior variable studied and each outcome or patient characteristic, and the interrater reliability data of each behavioral measure studied, if available.

To classify the behaviors observed, literature-based theoretical models were used. Verbal behaviors were classified according to the model described by Bird and Cohen-Cole¹² into one of three key functions of the interaction: data gathering to understand the patient (gathering information), development of rapport and responding to the patient’s emotions (developing a therapeutic relationship), and patient education and behavioral management (decision making and management). Figure 1 provides a schematic of the model. The model implies interrelations between the elements: rapport-building influences data gathering, both rapport building and data gathering affect decision making, and decision making affects outcomes. This method of classifying verbal behaviors shares common elements with the categorization schemes described by Roter and Hall,⁹ Ong et al,¹⁰ and Beisecker and Beisecker.¹³ Using this system, each behavior described in the review was classified into a category based on its most prominent function or use.

For the classification of nonverbal behaviors, a schema described by Harrigan and Rosenthal^{14,15} was used, which groups nonverbal behaviors primarily by anatomic position into the categories of trunk, arms, legs, head, and proximity or touch.

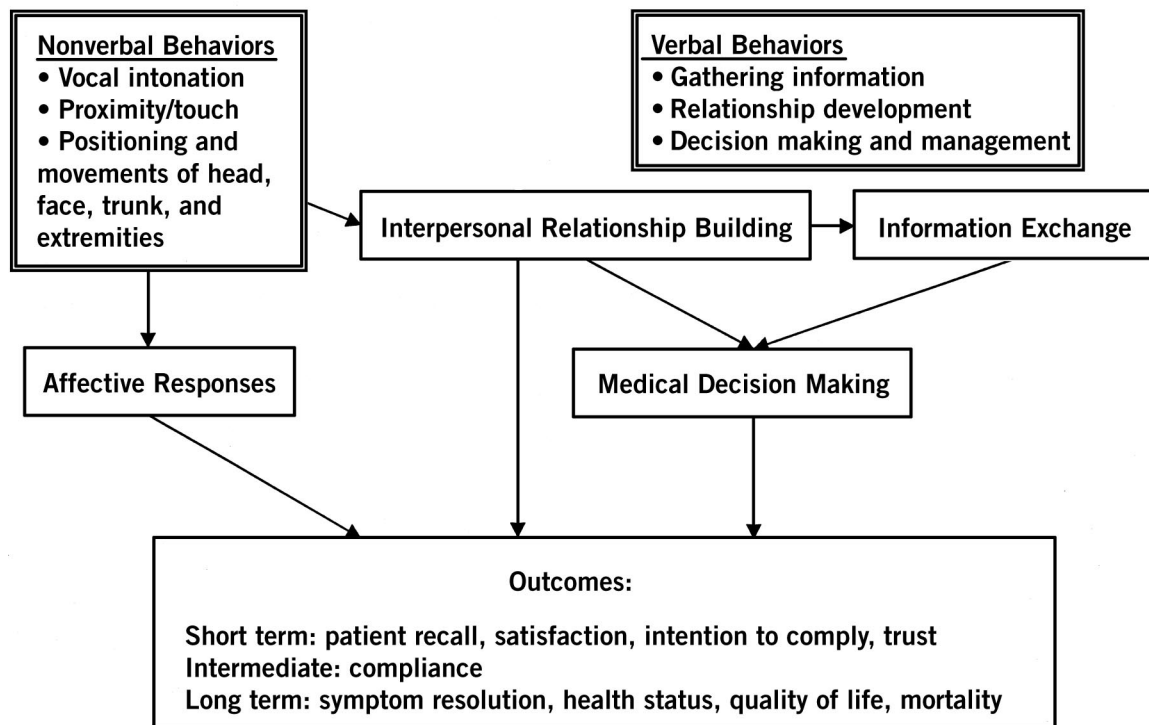


Figure 1. Domains of communication in the provider-patient relationship.

This classification system avoids the inferences inherent in some other coding systems about the meaning conveyed by nonverbal behaviors.^{16,17} Our theoretical model involves the interplay between nonverbal and verbal behaviors and implies interrelations with rapport-building and affective responses affecting patient outcomes.

Because definitions and classifications of discrete behaviors were not standardized across studies and the number of empirical studies meeting review criteria was small, a strict meta-analysis was not feasible. Instead, behaviors were tabulated according to the theoretical model, which allows similar behaviors to be compared visually.

For each behavior reporting significant statistical associations, we assigned its corresponding study a rating indicating its level of methodologic rigor. Two points were awarded to studies in which the measure of interest displayed strong evidence of reliability and the sample size was more than 20. One point was awarded if the study showed some indication of reliability testing and the sample size was more than 20, or if the sample size was smaller but the reliability was strong. Zero points were awarded if variables were poorly defined, reliabilities were unreported, reliabilities were not strong,

or the sample size was small. Strong reliability was defined as present when the variables being considered had kappa coefficients greater than 0.6 or Pearson correlation coefficients greater than 0.70.¹⁸

Results

Verbal Physician Behaviors

Sample Characteristics

Fourteen studies met the review criteria (Table 1).^{19–32} Two were set in pediatric outpatient clinics, one in a community-based private practice (family medicine), one in a general diabetes clinic, and the remainder in family medicine or internal medicine outpatient departments. Two studies focused strictly on new-patient visits with patients unknown to the physicians; the remainder primarily involved returning patients.

The mean age of the studied patient population, when reported, was 46 years. The median number of patient subjects was 113, the mean 165, and the range between 29 and 550. In one third of the studies at least 60% of the subjects were of racial or ethnic minorities. Female subjects were represented more frequently than male subjects; 12 of

Table 1. Physician Verbal Behaviors Associated with Clinical and Behavioral Patient Outcomes in Empirical Studies Performed in Office Settings.

Behavior of Physician	Ref	LOR	Sample Size (Patients; Providers)	Setting; Observation	Patient Outcomes Measure			
					Association	Reliability	Other	
Discrete Variables								
Interpersonal Relationship Building								
Empathy	19	2	55; 11	Pediatric outpatient clinic 9 Rs, 2 NPs; VT	Satisfaction	+†	Kappa = .69	Mothers with high exposure to empathy had higher visit satisfaction and greater reductions in their concerns
Patient-centered behavior	20	2	140; 24	Family physician offices 24 FPs; AT	Compliance	+†	93% agreement	Significantly related to patient-reported compliance and borderline significantly related to pill count measure
Passive behavior	21	2	115; 7	Pediatric outpatient department 7 MDs; AT	Satisfaction	+†	Kappa = .69	More patient centeredness was perceived as more interpersonally sensitive by patient
Tension release	22	0	154; 154	PC outpatient clinic 154 PC MDs; AT	Compliance	-†	NA	Negative correlation between active patient-passive MD and compliance
Encouragement	22	0	154; 154	PC outpatient clinic 154 PC MDs; AT	Compliance	+†	NA	Both joking and laughing from the patient and MD correlate with compliance
Nonintegrative behavior	19	2	55; 11	Pediatric outpatient clinic 9 Rs, 2 NPs; VT	Satisfaction	+†	Kappa = .69	Mothers with high exposure to encouragement more satisfied and rated their clinician more often as a "source for information and advice"
Explanation giving	22	0	154; 154	PC outpatient clinic 154 PC MDs; AT	Compliance	-†	NA	Formal, help withholding, rejecting MDs create patients with less compliance; but absence of behavior has no influence on compliance
Information Exchange								
Biomedical question asking (open- and closed-ended)	23	2	217; 9	Family med. outpt. clinic 9 MDs, 2 PAs; AT	Compliance	+†	93% agreement	Behavior in concluding segment was followed by lower BP readings at patient's home
Psychosocial (talk, questioning, counseling)	24	2	550; 98	11 primary care offices 89 internal med. MDs, 9 family med. MDs; AT	Satisfaction	-†	Kappa = .76	Inverse relationship between question asking about biomedical topics compared to psychosocial topics
Interruptions	25	2	537; 98	11 primary care offices	Satisfaction	+†	Kappa = .76	Despite its effect on patient satisfaction a psychosocial talk pattern was found in <25% of MDs
Time spent on history taking	24	2	550; 98	89 internal med. MDs 9 family med. MDs; AT	Satisfaction	+†	Kappa = .76	Interruptions and satisfaction correlations showed no association with sex of physician
Time spent on health education	26	2	23; 23	PC outpatient clinic 23 PC MDs and Rs; VT	Satisfaction	-†	Kappa = .71	Inverse relation of percent of time spent on health education and history taking
No feedback while taking history	27	2	100; 54	PC outpatient clinic 54 PC Rs; VT	Satisfaction	+†	72% agreement	
	27	2	100; 54	PC outpatient clinic 54 PC Rs; VT	Satisfaction	+†	72% agreement	
	22	0	154; 154	PC outpatient clinic 154 PC MDs; AT	Compliance	-†	NA	One-way information flow without feedback produces less patient-MD-reported compliance

Behavior of Physician	Ref	LOR	Sample Size (Patients; Providers)	Setting; Observation	Patient Outcomes Measure	Association	Reliability	Other
Antagonistic	22	0	154; 154	PC outpatient clinic 154 PC MDs; AT	Compliance	-†	NA	Withholding information, explanation, orientation rated as antagonistic communication skills for patient outcome by patients
Medical Decision Making								
Sharing medical data	28	2	29; 19	Urban diabetes clinic; 19 stud, PC Rs, NPs; VT	Comprehension	+‡	93% agreement	Diabetic patients comprehended the necessity of self-care better if they were informed about their past Hb1a readings
Directive	21	2	115; 7	Pediatric outpatient department 7 MDs; AT	Satisfaction	-‡	Kappa = .76	Less directiveness was perceived as more interpersonally sensitive by patient. Higher occurrences were especially unsatisfactory perceived if used in concluding segment
Discussion of treatment effects	29	0	101; ?	PC outpatient clinic PC MDs; AT	Problem understanding	-†	NA	
Attentiveness (in concluding part)	27	2	100; 54	PC outpatient clinic 54 PC Rs; VT	Satisfaction	+†	72% agreement	Task oriented behaviors (physical examination, treatment effects) positively correlated
Acquiescence (in concluding part)	30	2	52; 19	PC outpatient clinic 19 PC MDs, Rs; AT	Satisfaction	-‡	96% agreement	High level of behavior in history-taking phase has highly satisfied patients
	30	2	52; 19	PC outpatient clinic 19 PC MDs, Rs; AT	Satisfaction	+‡	96% agreement	Physicians who let go of formal control at the end were especially high rated
Global Assessment Variables								
Friendliness	24	2	550; 98	11 primary care offices 89 internal med. MDs, 9 family med. MDs; AT	Satisfaction	+‡	Kappa = .76	Emotional tone rated on audiotapes. Inversely related to dominance of MD
Angry or irritated	31	1	50; 2	PC outpatient clinic 2 PC MDs; AT	Compliance	-‡	Alpha: 0.60	Less expression of nervousness and anger of the MD was followed by greater compliance of patient. Authors conclude that MDs might have difficulty distinguishing between anger and nervousness of patient
Anxious or nervous	31	1	50; 2	PC outpatient clinic 2 PC MDs; AT	Compliance	-‡	Alpha: 0.60	
Empathy	29	0	101; ?	PC outpatient clinic PC MDs; AT	Compliance	-‡	NA	
	32	2	150; 15	PC outpatient clinic 15 PC Rs; direct observation	Satisfaction	+‡	94% proximal agreement	Physical appearance of MD did not correlate with patient outcome in same study
Courtesy	32	2	150; 15	PC outpatient clinic 15 PC Rs; direct observation	Satisfaction	+‡	94% proximal agreement	

Table 1. Continued.

Behavior of Physician	Ref	LOR	Sample Size (Patients; Providers)	Setting; Observation	Patient Outcomes Measure	Association	Reliability	Other
Tension showing	29	0	101; ?	PC outpatient clinic PC MDs; AT	Satisfaction	-†	NA	Verbal indicators of unrelaxed, tense MDs produced less satisfied patients
Listening behavior	32	2	150;15	Information exchange PC outpatient clinic 15 PC Rs; direct observation	Satisfaction	+†	94% proximal agreement	Good listening behavior especially in the history-taking phase was favored
Information-giving	32	2	150;15	PC outpatient clinic 15 PC Rs; direct observation	Satisfaction	+†	94% proximal agreement	Providing the patient with information was especially recognized with satisfaction if occurred at the end of encounter
Medical Decision Making								
Dominant	24	2	550;98	Primary care offices 89 internal med. MDs, 9 family med. MDs; AT	Satisfaction	+‡	Kappa = .76	Strong inverse relationship with MD friendliness
Directive	30	2	23;23	PC outpatient clinic 23 PC MDs and Rs	Satisfaction	-‡	Kappa = .71	Better perceived by older patients
Orienting the patient	29	0	101; ?	PC outpatient clinic PC MDs; AT	Compliance	-‡	NA	See "directive" as a discrete variable
Showing solidarity	29	0	101; ?	PC outpatient clinic PC MDs; AT	Compliance	+‡	NA	Primarily in concluding segment well perceived by patient
During Physical Examination								
Orienting the patient	29	0	101; ?	PC outpatient clinic PC MDs; AT	Satisfaction	+‡	NA	Orientation about the nature and findings of examination create high-satisfaction levels
Expression of personal opinions	29	0	101; ?	PC outpatient clinic PC MDs; AT	Satisfaction	-‡	NA	Negatively related to patient understanding of problems and satisfaction
Time Variable								
Total time spent for encounter	32	2	150;15	PC outpatient clinic 15 PC Rs; direct observation	Satisfaction	+‡	94% proximal agreement	Existing but weak correlation reported

Ref—reference, LOR—level of rigor, R—resident, NP—nurse practitioner, VT—videotape, FP—family physician, AT—audiotape, PC—primary care, MD—board-certified physician, NA—not available, BP—blood pressure, PA—physician's assistant, Hb1_c—hemoglobin 1_c.

**P* < .05.

†*P* > .01.

‡*P* > .005.

the 15 reviewed studies reported that 56% or more of their subjects were female.

The mean number of providers was 40 (median 19, range 2–154). Physician age in most cases was not available. Four of the five studies that disclosed physician specialty involved board-certified family physicians, the remaining nine studies used primary care physicians but did not disclose physician specialty. Three studies worked with primary care residents and one with medical students and nurse practitioners. When reported, the majority of the providers were male and white.

Eight of the 14 reviewed studies used audiotapes as their primary method of observation. Four used videotapes, one a transcript of an audiotape, and one direct observation by an independent rater who was positioned behind a two-way mirror. A variety of coding systems were used to rate behaviors. All except two studies reported the measurements and results of their coding reliability, primarily as percent agreement or interrater correlation (number of coders ranged between 2 and 7). Reported percent agreement rates ranged between 72.3% and 96%, and interrater correlation coefficients varied from 0.08 to 0.69.

Among the outcomes evaluated, satisfaction of the patient with the visit was most frequently used.^{19,25,26,27,30,32,33} Other measured outcomes were compliance with a prescribed therapeutic regimen^{23,39,31} and comprehension.^{28,29}

Verbal Behaviors Having Significant Associations with Clinical Outcomes

Twenty-two physician behaviors were found to be positively associated with health outcomes. These behaviors included the physician's expression of intellectual appreciation of a patient's situation (empathy as a discrete variable)¹⁹; empathy as a global assessment variable³²; provider statements of reassurance or support, and encouragement of the physician for patient's questions (patient-centered behavior)³⁴; allowing the patient's point of view to guide the conversation in the concluding part of the visit³⁰; high proportion of objective statements in the concluding part of the visit (explanation)²³; a predominantly passive physician²²; a physician's expression of positive reinforcement or good feelings of the provider in regard to patient's actions, possessions, or self (encouragement)¹⁹; laughing and joking from the provider's side (tension release)²²; physicians who addressed problems of daily living,

social relations, feelings, and emotions of the patients (psychosocial talk)²⁴; question (both closed- and open-ended) asking about and counseling for psychosocial issues²⁴; increased time on health education²⁷; sharing medical data with the patient²⁸; discussion of treatment effects²⁷; friendliness²⁴; courtesy³²; receptivity to patient questions and statements (listening behavior)³²; summarization, talking at the patient's level, and clarifying statements (information giving)³²; a more dominant physician²⁴; orienting the patient during the physical examination²⁹; increased encounter length³²; and more time spent on history taking²⁷ or patient health education.²⁷

The following 14 behaviors have been shown to be negatively associated with patient outcomes: passive acceptance, negative social-emotional interactions, formal behavior, antagonism and passive rejection (nonintegrative behavior)²²; high rates of biomedical questioning²⁵; interruptions²⁶; a one-way information flow from the patient to the provider (information collection without feedback)²²; antagonistic behavior²²; directive behavior^{29,34}; utterances concerning the patients experience or showing interest in the patient (attentiveness)³⁰; irritation³¹; nervousness³¹; extensive feedback given in the concluding part of the visit¹⁹; anxiety or tension²⁹; dominance²⁶; directiveness²⁹; and expression of opinion during the physical examination.²⁸

Nonverbal Behaviors

Sample Characteristics

Eight studies were reviewed (Table 2).^{14–17,26,35–37} The settings for six were family practice centers. One was conducted in an unspecified ambulatory care center, and one was conducted in an internal medicine outpatient clinic. Most visits involved routine care or chronic disease checkups, and most patients were recruited in waiting areas. One study was a simulated office visit in which observers rated tapes of purposely manipulated physician behaviors and settings.

Six studies reported demographic data about patients who were subjects. Of these studies, the mean number of patient subjects was 36 (range 18–100) and the mean reported patient age was 41 years (median 35.8 years, range 17–88 years). All studies but one had at least 50% female subjects; the exception consisted entirely of male participants. When reported, most participants were white.

Table 2. Physician Nonverbal Behaviors Associated with Clinical and Behavioral Patient Outcomes in Empirical Studies Performed in Office Settings

Behavior	Ref	LOR	Sample Size (Patients; Providers)	Setting	Comparison Measure	Association	Reliability	Other
Head								
Gaze	15	0	?: 9	Family medicine clinic Residents	Rapport	+	Pearson = .66-1.0	High-rapport physicians engaged in less mutual gaze; predicts physician rapport level
	35	1	38; 10	Family medicine clinic Residents	Congruent behavior	+\$	Kappa = .64	Physicians and patients showed congruence in their frequencies of gazes from partners
	17	1	34; 15	Family medicine center	Satisfaction	-†	Interrater agreement > .90	Increased patient gaze toward physician results in less satisfaction
				Board-certified MDs				
Head nod	26	2	100; 50	Ambulatory care center	MD sex	+†	Pearson = .96	Female physicians nod more
				Primary care residents, MDs				
	14	1	?: 4	Medical office; NA	Rapport	+\$	r = .90	Greater rapport when physicians nodded head
Trunk								
Body orientation	15	0	?: 9	Family medicine clinic Residents	Rapport	+	Pearson = .66-1.0	Low-rapport physicians oriented 45°-90° away from patient; predicts physician rapport level
	17	1	34; 15	Family medicine center	Satisfaction; understanding	+†	Interrater agreement > .90	Direct physician body orientation increases patient satisfaction and understanding
				Board-certified MDs				
	36	2	41; 10	Teaching hospital Primary care residents	Education, sex, age	+\$	Kappa = .93	Reciprocal body orientation was associated with higher patient education, male sex, and age less than 30 y
				Teaching hospital Primary care residents	Anxiety level	+	Kappa = .93	More consistent physician body orientation when speaking with highly anxious patients
	36	2	41; 10	Teaching hospital Primary care residents	Anxiety level	-†	Kappa = .93	Less reciprocal physician body orientation when speaking with highly anxious patients
	36	1	34; 15	Family medicine center	Understanding	-†	Interrater agreement > .90	Patient indirect body orientation shows less understanding
				Board-certified MDs				
	35	1	38; 10	Family medicine clinic Residents	Satisfaction, dominance, affiliation	+†	Kappa = .92	Physician indirect body orientation perceived as dominant by patients
	35	1	38; 10	Family medicine clinic Residents	Congruent behavior	+\$	Kappa = .64	Physician and patient display congruence in body orientation
Forward lean	14	1	?: 4	Medical office Specialty NA	Rapport	+\$	r = .87	Physicians who lean forward rated as having higher rapport
	17	1	34; 15	Family medicine center	Satisfaction; understanding	+†	Interrater agreement > .90	Physicians who lean forward have more satisfied and understanding patients
				Board-certified MDs				

Behavior	Ref	LOR	Sample Size (Patients; Providers)	Setting	Comparison Measure	Association	Reliability	Other
Backward lean	14	1	?: 4	Medical office Specialty NA Family medicine center Board-certified MDs	Rapport Satisfaction; understanding	-\$ -\$ -\$	$r = .87$ Interrater agreement $> .90$	Physicians who lean backward rated as having lower rapport Physicians who lean backward have less satisfied and understanding patients
Arms								
Uncrossed arms	14	1	?: 4	Medical office Specialty NA	Rapport	+\$	$r = .46$	Physicians with uncrossed arms rated as having higher rapport
Crossed arms	14	1	?: 4	Medical office Specialty NA	Rapport	-\$	$r = .46$	Physicians with crossed arms rated as having lower rapport
Symmetrical arms	15	0	?: 9	Family medicine clinic Residents	Rapport	+\$	Pearson = .66-1.0	High-rapport physicians have more symmetrical arm positions
Asymmetrical arms	15	0	?: 9	Family medicine clinic Residents	Rapport	+\$	Pearson = .66-1.0	Low-rapport physicians have more asymmetrical arm positions; position predicts physician rapport classification
Gestures	35	1	38;10	Family medicine clinic Residents	Congruent behavior	+\$	Kappa = .64	Physicians and patients displayed congruence in frequency of illustrative gestures
	36	2	41;10	Teaching hospital Primary care residents	Frequency of physician adapters	+\$	Kappa = .71	Physicians used more adapters when interacting with patients younger than 30 y
Body-focused movements	37	0	20;28	Family medicine clinic Board-certified MDs	Location of self-touches	+	81% agreement	Most self-touches by physicians and patients occur on head, face, and neck area
	16	2	25;25	Family medicine clinic Residents	Patient agenda	+\$	Correlation = .80-.90	Patients with hidden agendas participated in more hand-to-body self-touching than patients with single agendas
Object-focused movements	37	0	20;28	Family medicine clinic Board-certified MDs	Location of self-touches	+\$	81% agreement	Patients performed more hand-hand and hand-arm self-touching than physicians
Legs								
Uncrossed legs	15	0	?: 9	Family medicine clinic Residents	Rapport	+\$	Pearson = .66-1.0	High-rapport physicians spend more time with their legs uncrossed
Crossed legs	15	0	?: 9	Family medicine clinic Residents	Rapport	+\$	Point biserial = -.646	Position predicts if physician is classified as high or low rapport
Touch								
Touch	35	1	38;10	Family medicine clinic Residents	Satisfaction, domination and affiliation	+\$	Kappa = .89	Physician use of task touch related to patient perceptions of physician dominance
	36	2	41;10	Teaching hospital Primary care residents	Physician use of task touch	+\$	Kappa = .92	Physician use less task touch with female patients than with male patients
	17	1	34;15	Family medicine center Board-certified MDs	Satisfaction; understanding	-\$	Interrater agreement $> .90$	Physicians who touch more have patients with lower understanding and satisfaction
	35	1	38;10	Family medicine clinic Residents	Congruent behavior	-\$	Kappa = .62	Physicians use more social touch than patients
Distance								
Distance	36	2	41;10	Teaching hospital Primary care residents	Physician distance	+\$	Kappa = .79	Physicians seated closer to patients aged 30-50 y than any other age

Ref—reference, LOR—level or rigor, MD—physician, NA—not available.
 * $P < .06$; † $P < .05$; ‡ $P \approx .01$; § $P < .005$.

Most physician participants were board-certified family physicians or family medicine residents. Eight studies reported demographic data on physician participants. The mean number of physicians was 20, the median 17, and the range 4 to 50. The mean physician age for three reporting studies was 32 years (median 30 years). The total age range of four reporting studies was 26 to 36 years.

All studies used some method of interrater reliability assessment for their measures. Most used interrater percent agreement.^{14,16,17,37} Two reported kappa tests,^{35,36} two used a Pearson correlation coefficient,^{15,38} and one used a point biserial correlation.¹⁵ Analytic comparisons used simple bivariate statistics.

A variety of dependent variables was represented by the reviewed studies. Only one study¹⁷ used outcome measures of satisfaction and understanding. One article³⁸ compared differences in nonverbal behavior based on the sex of the physician. Two studies^{14,15} rated physicians' levels of rapport and found significant differences depending on their nonverbal behavior. One study³⁷ exclusively studied self-touching and compared how physicians and patients touch themselves differently. One study¹⁶ examined differences in nonverbal behavior between patients who had hidden agendas (issues that patients wanted to talk about but did not offer as reasons for coming to the physician) and overt agendas. Another study³⁵ investigated congruence and differences between physicians and patients in certain nonverbal behaviors. A final study investigated how physician nonverbal behavior varied according to patient characteristics (age, sex, level of anxiety, and level of education).³⁶

Nonverbal Behaviors Showing Statistically Significant Associations with Patient Outcomes or Patient Characteristics

Sixteen specific nonverbal behaviors were found in one or more studies to be significantly associated with outcomes of interest.

Those behaviors associated with favorable outcomes included less mutual gaze,¹⁵ head nodding of the provider,¹⁴ forward lean,^{14,17} more direct body orientation,¹⁴ uncrossed legs and arms,¹⁴ and arm symmetry.¹⁵

Those behaviors associated with unfavorable outcomes included more patient gaze,¹⁷ body orientation 45 to 90 degrees away from the patient,¹⁵ indirect body orientation,³⁶ backward lean,^{14,17}

crossed arms,¹⁴ task touch,³⁵ and frequent touch.¹⁷ No association could be found for the following behaviors: sideways leaning,¹⁷ leg position,¹⁴ arm position asymmetry,¹⁷ amount of physician touch,³⁶ and physician-patient distance.^{15,17}

Discussion

There is no doubt that the physician-patient interaction makes up a central and critical element of ambulatory care medicine. A favorable medical interview is essential to creating a good interpersonal relationship, information exchange, and optimal medical decision making.^{10,39,40} The character of the interactions influences a variety of patient outcomes, including short-term outcomes such as satisfaction and recall, intermediate outcomes such as adherence, and long-term outcomes such as symptom resolution and quality of life.⁸ What is less clear is which aspects of physician interaction styles are most critical for favorable patient outcomes.^{8,41} The area is rife with opinion, but actual empirical data are relatively scarce.

This article reviews to what extent published evidence exists linking specific verbal and nonverbal behaviors to outcomes in interactions between outpatient primary care providers and their patients. In contrast to previous reviews,^{10,39,40} this review restricted itself to studies performed in primary care office settings, concentrated on specific behaviors rather than more general assessments of communication, limited itself to studies in which the encounter was evaluated and coded by a neutral observer, and included only studies in which statistical relations between observed interactional elements and patient outcomes (or, in the case of nonverbal behaviors, patient or provider characteristics) were examined. Thus, this review honed in on behaviors that are reliably measured and that have empirical evidence supporting their influence on patient outcomes.

A total of 36 verbal and 16 nonverbal behaviors were identified from the 22 included studies. From the evidence of this review, it can be concluded that the physician should focus on the following verbal behaviors that have been linked ($P < .05$) with patient satisfaction, compliance, comprehension, or perception of a good interpersonal relationship: expression of an intellectual appreciation of a patient's situation (empathy)^{19,32}; courtesy³²; friendliness²⁴; reassurance, support, and encouragement

for patient's questions (patient-centered behavior)²⁰; explanation giving²³; and positive reinforcement or good feelings in regard to patients' actions, possessions, or self (encouragement).¹⁹ Laughing and joking from the provider's side (tension release)²² also seems to be beneficial, although they were measured only in a study with a low level of rigor. Levinson et al⁴² showed that in claims other than malpractice, primary care physicians used humor more often and laughed more. Models for implementing empathy and tension release were developed by Wender,³⁴ Suchman et al,⁴³ and Bennett.⁴⁴

Plaintiffs of malpractice claims rated dysfunctional delivery of information in 25% of the filed cases⁴⁵ and poor listening behavior of the provider in 8%⁴⁵ and 13%^{45,46} of the filed cases as the main reason for suing their physician. To enhance information exchange, the following should receive particular attention: listening³²; health education²⁷; summarization of patient statements, talking on the patient's level, and clarifying one's own statements³²; addressing patient problems of daily living, social relations, and emotions²⁴; and psychosocial counseling.²⁴ Patient satisfaction after a visit is often decreased by excessive biomedical question asking,²⁴ and interruptions of their own talk.²⁶ Contrary to these results Levinson et al⁴² reported that the amount of psychosocial questions and counseling did not differ between physicians with and without malpractice claims.

Several researchers emphasized the importance of participatory decision making and concluded that patients who are more involved in this process have better health outcomes.⁴⁷⁻⁴⁹ In this context, sharing medical data²⁸ and discussing treatment effects²⁷ have been shown to improve comprehension and satisfaction. Unduly dominant,^{24,26} attentive,³⁰ angry,³¹ nervous,³¹ and directive²⁹ behavior of the provider should be avoided.

Studies linking nonverbal behavior to patient outcomes are rare. Only one article reported such an investigation in the primary care setting¹⁷; it found increased satisfaction and comprehension of instructions among patients whose physicians leaned forward and directly faced them. In addition, it found that satisfaction was reduced when physicians leaned backward or touched the patient frequently during the interview. No other primary-care-based empirical studies linking specific provider nonverbal behaviors to patient outcomes were

found. Thus, although nonverbal behavior has been shown to be of critical importance in a variety of other settings, such as job interviews⁵⁰⁻⁵² and psychotherapy,⁵³⁻⁵⁵ more research is needed to determine which behaviors in primary care medical practice are most critical, and in what situations. Of particular note is that no study was found that linked facial expression and voice intonation to patient health outcomes, although Ekman and Friesen²⁰ developed the Facial Action Coding System, which is widely used in studies with demented, comatose, or dental patients. Another interesting finding of the review is that the physical examination, which is rife with such nonverbal elements as touch and gestures, has not been empirically studied.

Published findings are not always intuitive; for example, the number of questions asked about a patient's illness has been found to be inversely related to patient satisfaction,²⁵ and mutual gaze during the interaction was associated with reduced rapport.¹⁵ Other findings are more commonsense; for example, empathic, patient-centered verbal styles were associated with high patient satisfaction,^{19,32} and physicians who faced the patient were rated as having higher rapport compared with those who did not.^{15,17}

One limitation of current studies – and of the field of communication research – is the lack of consensus on what to measure. Boon and Stewart,⁵⁶ in a review of 44 instruments, stressed that most published instruments have been used in few studies and lack validation. This review found similar variation in measurement methods; the 15 verbal studies used 11 different coding systems, and even the best known systems tended to be used by only one work group.^{9,33} The diversity of coding systems, while reflecting wide interest in the area, indicates that researchers have yet to agree on what to measure or how and raises questions about the extent to which researchers have built on the results of previous studies. Furthermore, the evaluative nature of many items (eg, acquiescence, withholding feedback) raises concerns about both validity and reliability of reported findings.

Another limitation of existing research is that most studies involved chronic care visits of known patients. Although this type of visit constitutes the majority of office encounters,⁵⁷ other visit types, such as new-patient visits or encounters around major health events (eg, a new diagnosis of hyper-

tension), might be especially crucial in terms of health outcomes. Another methodological gap of the methods is the cross-sectional design of all reviewed studies, which does not allow data collection for ongoing physician-patient relationships. Although qualitative studies provide a useful tool to investigate provider-patient encounters, the evidence-based format of this review did not allow an inclusion of these studies in this review.

Many studies used a complex coding system with an immense number of measured behaviors. Only a few of these studies,^{24,25,29,30,58} however, actually applied a theoretical framework to sort those different behaviors into broader and more understandable constructs. Doing so is necessary if a sufficiently broad language is to be developed to incorporate the unique variables of the individual investigators into meaningful groupings, thus allowing communication behaviors to be compared across populations and settings. Promising new methodologic tools are data management software packages that allow the simultaneous recording and timing of multiple events and behaviors on digitized compact disk files.⁵⁹ These data management tools have already been applied to a variety of settings in the study of interactions, including animal⁶⁰ and primate⁶¹ behavior, studies of drug effects on behavior,⁶² observations of caregivers and care recipients in Alzheimer disease,⁶³ and studies of marital couples.⁵⁹ Such methods offer considerable promise for advancing the field of provider-patient research, provider education, and quality improvement in primary care.

Despite the limitations of current research, enough is known to guide the improvement of patient care encounters and the training of physicians. Furthermore, behavior change appears to be a possible and realistic goal. Bertakis,⁶⁴ for example, found that physicians could be trained to summarize recommendations and request feedback at the end of an office visit. Maguire et al,⁶⁵ who conducted a training program for medical students, found that 5 years later the students still adhered to the behaviors taught, and that patient satisfaction was greater among this group in comparison with a control group that did not receive the intervention. Smith et al²¹ conducted a randomized controlled trial on the effectiveness of a 1-month training elective in interviewing for primary care residents; results showed that trained residents were superior in data gathering, attitudes, and somatization man-

agement. Furthermore, consistently higher patient satisfaction was noticed for the intervention group. The educational task is challenging, however. A recent trial in a health maintenance organization failed to show increased patient satisfaction after physicians completed communications skills training. The authors concluded that to improve global patient satisfaction, training programs need to be intensive, teach a broad range of skills, and provide ongoing performance feedback.^{66,67}

As the technology and complexity of medicine advance, the interpersonal aspects of practice remain important targets for study. New analytical techniques that allow for the simultaneous coding of multiple behaviors will facilitate the exploration of the interplay between various verbal and non-verbal behaviors, thereby allowing investigators to empirically evaluate and refine theoretical models (eg, Figure 1). Continued inquiry could yield new and important findings with direct application to physician teaching and to quality improvement in primary care practice.

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