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# Affective and Instrumental Communication in Primary Care Interactions: Predicting the Satisfaction of Nursing Staff and Patients

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Verbal and nonverbal communication between nursing staff and patients has received scant research attention. This study examined patients' and nursing staff members' global affective and instrumental communication, mutual influence, and relationship to postvisit satisfaction. This study employed ratings of videotaped primary care visits of 81 nursing staff members with 235 patients, and assessed communication in 2 channels: nonverbal visual and speech including vocal tone. Communication channel differences and prediction of patient satisfaction were examined. The visual and vocal communication of nursing staff members and patients robustly predicted each other's satisfaction and reflected their own satisfaction with the dyadic visit. Affect was communicated more clearly through the speech with vocal tone channel, whereas instrumental communication was stronger in visual nonverbal behavior. Patients' and nursing staff members' behaviors of pleasantness and involvement frequently co-occurred.

Communication is a key ingredient in interpersonal relationships (Knapp, 1972) and is a central component of medical care delivery and patient outcomes (Lambert et al., 1997; Roter & Hall, 1992; Thompson, 1998). In primary care research, verbal and nonverbal communication between physicians and patients and the outcomes of various communication styles and behaviors have been studied extensively. Empirical evidence supports the relationship between the quality of physician–patient interaction and outcomes of patient satisfaction, treatment adherence, and health (Hall, Horgan, Stein, & Roter, 2002; Ong, de Haes, Hoos, & Lammes, 1995).

Exploration of affective and instrumental verbal and nonverbal communication in the context of nursing staff–patient interactions has received far less research attention, however (Kasch, 1986; Shattell, 2004). Nursing staff members are

critically important allied health professionals (Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Wanzer, Booth-Butterfield, & Gruber, 2004) who care for and communicate with patients. In primary care practice, patients often meet first with members of the nursing staff, to whom they explain their medical problems and reasons for the visit, and by whom their vital signs are assessed. After the visit, nursing staff members provide directives for further care, including diagnostic tests and self-directed treatment plans (Fairman, 2001; Heritage & Robinson, 2006). Nursing staff members represent the first significant point of contact with the patient and can set the tone for the entire visit, influencing the communication style, expression of affect, and transfer of information in the subsequent physician–patient interaction (Kosinska & Niebroj, 2003). Survey research has demonstrated that on average, patients report having greater trust in nurses than in physicians (DiMatteo, Shugars, McBride, & O'Neil, 1995). Time constraints in the medical visit may necessitate reliance on nursing staff–patient interactions for gathering data from patients, educating them, and putting them at ease.

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Understanding nursing staff–patient communication is thus critical to improving care (Ledlow, O’Hair, & Moore, 2003).

### Theoretical Rationale for this Research

Two main theoretical perspectives drive this research. First, there is a need to attend to nonverbal communication in the provider–patient relationship, which may be as important as verbal communication but receives far less research attention (Hall, Harrigan, & Rosenthal, 1995). Dimensions of interpersonal relationship (e.g., positivity, activity, and dominance) are communicated through subtle nonverbal messages in facial expressions, body movements, interactional distance, vocal tone, and other nonverbal channels. Research separating verbal and nonverbal communication for study allows understanding of subtle nonverbal expressions of emotion and the role of various channels in predicting outcomes such as patient satisfaction (Roter, Frankel, Hall, & Sluyter, 2006). Our research is informed by past work on “thin slices” of behavior, that indicates that behavioral observations of 5 min or less can predict interpersonal outcomes, and that affective judgments can have considerable predictive power (Ambady & Rosenthal, 1992). Nonverbal communication has been important in research on medical treatment encounters, although empirical work in this area has been in short supply, with little focused on nonphysician health professionals such as nursing staff (Cline et al., 2006; Martin & Friedman, 2005). In this research, affective behaviors are expected to be revealed in both verbal and nonverbal communication channels, and differences between these channels are expected to be measurable.

The second guiding theoretical framework driving this research involves principles of reciprocity and mutual influence (Berger & Calabrese, 1975; Cappella, 1981) as they are addressed from the perspective of communication accommodation theory (Giles & Coupland, 1991). This theory suggests that individuals may “accommodate” their communication behaviors to be similar to those of the person with whom they are conversing. Social status differences can influence this process; thus, this theory is particularly helpful in guiding research on health professional–patient relationships such as the more egalitarian nurse–patient relationship (Aiken, 1983; Watson & Gallois, 1998). Compared with physicians, greater parity in social status between nursing staff members and patients is likely to facilitate partnership, rapport, and interactional synchrony (Hall et al., 1995). Thus, we expect considerable similarity between nursing staff and patient behaviors.

### Affective and Instrumental Communication

In the medical interview, communication can serve affective and instrumental functions (Bensing & Dronkers, 1992). Affective communication involves the socioemotional interchange that is part of the development of a caring

relationship and may be more likely demonstrated through nonverbal messages, such as facial expressions or gestures, than through words. Instrumental behavior, on the other hand, is task-oriented and focused on the transmission of information and the management of tasks (Caris-Verhallen, Kerkstra, & Bensing, 1997; Cegala, 1997). Affective communication in physician–patient interaction has been studied extensively, and there is considerable evidence that it is as important to patient outcomes as instrumental communication (Bensing & Dronkers, 1992; Hall, Epstein, DeCianitis, & McNeil, 1993; Haskard, Williams, & DiMatteo, in press). Affective and instrumental communication may also facilitate patient involvement and shared decision-making (Brashers, Haas, & Neidig, 1999). Studies show that subtle verbal and nonverbal behaviors convey positive affect and influence patient satisfaction and adherence. For instance, certain aspects of surgeons’ rated vocal tone are predictive of their past malpractice claims (Ambady et al., 2002). Different types of nonverbal behavior have been related to standardized patient satisfaction (Griffith, Wilson, Langer, & Haist, 2003). Studies showing the relationship of physicians’ affective behavior to patient outcomes indicate the need for similar research in the context of nursing staff–patient communication.

### Communication and Satisfaction

Researchers have explored the meaning and dimensionality of satisfaction (Collins & O’Cathain, 2003), and have evaluated patient-level variation in the communication patterns that predict satisfaction (Dutta-Bergman, 2005). Theoretical examinations of nursing staff–patient communication and patient satisfaction have emphasized empathy, patient-centeredness, friendliness, and a caring attitude (La Monica, Wolf, Madea, & Oberst, 1987; McCabe, 2004) as well as involvement (or interpersonal engagement) communicated through nonverbal language (Gilbert, 2004). Empathy and communication may be emphasized in nursing training, but there exists an immense need for empirical work to examine how affective communication is manifested in primary care nursing practice. It is essential to analyze global nursing staff–patient affective and instrumental communication in relation to patient satisfaction to improve the quality of nursing care (Harris, Swindle, Mungai, Weinberger, & Tierney, 1999; Kasch, 1986; Poulton, 1996).

### Nursing Staff and Patient Outcomes

There is evidence for the central role played by the *frequency* and *quantity* of nursing staff–patient interactions in hospitalized patient care (Larrabee et al., 2004). Patient mortality has been shown to increase proportionally with increasing patient:nurse ratios (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). Nurse-led interventions and counseling have improved medication adherence in HIV/AIDS

patients (Kalichman, Cherry, & Cain, 2005), and interventions designed to increase nursing staff members' "caring behaviors" have been shown to significantly increase their patients' satisfaction (Dingman, Williams, Fosbinder, & Warnick, 1999; Yeakel, Maljanian, Bohannon, & Coulombe, 2003). In the pediatric setting, nurses used more positive affective communication such as friendliness and agreement with children than with parents, and pediatric patients were more active when the nurse demonstrated more positive affect (Shin & White-Traut, 2005). Nurses' nonverbal communication with the elderly, including gazing, nodding, and smiling, was related to verbal communication about lifestyle habits and socioemotional topics, although no direct patient outcomes were assessed (Caris-Verhallen, Kerkstra, & Bensing, 1999). Training of nurses in giving attention to the unique needs of older patients, helping patients to feel more capable, and using back-channel communication, open-ended questions, and nonverbal communication, has demonstrated improvements in various aspects of nurse-patient communication (Caris-Verhallen, Kerkstra, Bensing, & Gryndonck, 2000). The findings of Caris-Verhallen et al. (1999) and Caris-Verhallen et al. (2000) indicate the need for research providing insight into the outcomes of nursing staff-patient communication. Caris-Verhallen et al. (1997) noted several areas in which nursing staff-patient communication research has been lacking: development of new observational methodologies, exploring patients' communication, and understanding how nursing staff behavior influences outcomes. This study addresses these areas, focusing on the outcomes of patient and nurse satisfaction.

### Nursing Staff Satisfaction with the Visit

Nurse satisfaction has been studied in the context of work environments and found to be a central factor in nurse staffing and turnover (Irvine & Evans, 1995). Heavy workloads and inability to provide quality care may affect nurses' own satisfaction and the quality of their communication with patients (McGillis Hall & Kiesners, 2005). Stressors related to changing technology may also affect the development of the nursing staff-patient relationship (Foster & Hawkins, 2005), and research suggests that aspects of nursing staff-patient communication affect nursing staff satisfaction (Agho, 1993). Detailed empirical examination of this issue has been rare, however (Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). Nursing staff satisfaction with individual visits may be connected to their satisfaction with their work; thus, research on visit-specific nursing staff satisfaction would be enlightening.

### Summary and Research Questions

The purpose of this research is to examine nursing staff members' and patients' speech and visual nonverbal affective and instrumental communication toward one another in

the primary care medical visit, and the relationship of these communication channels to the satisfaction of both nursing staff and patients with each other and with the medical visit. The goal is to explore this infrequently studied area of health care communication and to identify the precise dimensions of communication that predict positive nursing staff-patient relationships using a global rating scale developed for the purposes of this research; thus, purposeful research questions, rather than precise hypotheses, are presented here. The research questions are the following:

- RQ1a: Do affective and instrumental behaviors of nursing staff in the primary care setting predict their patients' satisfaction?
- RQ1b: Are affective and instrumental behaviors from the speech channel or those from the visual nonverbal channel more predictive of patient satisfaction?
- RQ1c: Are affective and instrumental behaviors of nursing staff communicated more strongly through speech or through visual nonverbal communication?
- RQ2: Do patients reflect their satisfaction in their own affective and instrumental behaviors?
- RQ3: What affective and instrumental behaviors of patients and nursing staff predict or reflect nursing staff members' satisfaction?
- RQ4: Do nursing staff and patients mirror or reciprocate one another's affective behavior (e.g., do kindness and sensitivity beget the same)?

## METHOD

### Overview

The primary research questions in this study address the affective and instrumental communication behaviors of nursing staff and patients by using rating methods that have been developed and studied extensively in past research (Charon, Greene, & Adelman, 1994; DiMatteo, Robinson, Heritage, Tabarah, & Fox, 2003; Hall, Irish, Roter, Ehrlich, & Miller, 1994). These methods involve global ratings of affective (otherwise known as expressive) behavior by "naïve" raters. Global ratings generally tend to be used less frequently than interactional analysis schemes, which code every utterance (e.g., the Roter Interaction Analysis System; the Coordination and Competence System, see, e.g., McNeilis, 2001; the Relational Communication Scale for Observational Measurement, Gallagher, Hartung, & Gregory, 2001). It is the case in the Roter Interaction Analysis System, however, that nine dimensions of global affect rating have proven to be quite valid in research on provider-patient communication (Bensing & Dronkers, 1992; Cooper et al., 2003; Thompson, 2001). Global ratings can offer valuable assessments of verbal and nonverbal communication behaviors

in the nursing staff–patient visit, and including patients’ perceptions with rated assessments of communication allows a more thorough understanding of the interactional forces at work in the visit (Franks et al., 2006).

### Study Procedures

Data were collected as part of a larger “Communication and Satisfaction with Primary Care Teams” study (for which the third author is principal investigator). Community primary care medical practices were randomly selected from three nonstaff-model health maintenance organizations located across a large Southern California metropolitan area. Health care providers at the potential sites were recruited by the principal investigator; in each of the 34 practices that agreed to participate, between one and five nursing staff members took part in the study. All recruited practitioners and patients at the included practices completed informed consent forms that were approved by the institutional review boards at the participating institutions. Nursing staff were eligible if they were licensed practical nurses, licensed vocational nurses, registered nurses, or certified medical assistants; we have used the term *nursing staff* to include the different qualification levels. After completion of the nursing staff–patient interaction, practice physicians also participated and are the subject of other research papers. Up to 10 patients were sampled from each practice; to be eligible, patients were required to be English speaking and visiting the office for a new medical problem. Patients were approached consecutively in the waiting area by a research assistant until the maximum number needed per site had agreed to participate. Patients filled out an informed consent form in which they agreed to videotaping in the exam room, were informed that they could stop the videotaping at any time if they desired to do so, and completed both pre- and postvisit questionnaires. The previsit questionnaires were filled out prior to the visit with the nursing staff member. The postvisit questionnaires, which assessed both the visit with nursing staff and the visit with the physician, were filled out after the completion of the entire visit. This study presents data for 235 patients with both questionnaire data and a videotape of the nursing staff–patient visit; these patients were recorded in interactions with a total of 81 nursing staff members.

### Measures

Four survey measures were included: (a) Patients’ Previsit Questionnaire, which assessed their demographic characteristics such as age, race, education, insurance type, and income; (b) Patients’ Postvisit Questionnaire, an abbreviated version of the Patient Satisfaction Questionnaire-18 developed and validated as part of the RAND Medical Outcomes Study (Marshall & Hays, 1994; This questionnaire

evaluates patients’ satisfaction, using 5-point Likert-type scales, on a 12-item instrument that has been validated in various patient care contexts and includes general satisfaction, technical quality of care, interpersonal style, communication, and time spent (Ong et al., 1995); (c) Nursing Staff Demographic Information Survey, involving questions about date of birth, gender, education, nursing qualifications, and ethnicity; (d) Nursing Staff Postvisit Questionnaire, involving 2 items that assess the nursing staff members’ comfort and satisfaction with the interaction with the patient from 1 (*very dissatisfied/uncomfortable*) to 5 (*very satisfied/comfortable*).

### Global Affect and Instrumental Rating Measures

Separate global ratings of the affective and instrumental verbal and nonverbal behavior of nursing staff and patients in the visits (based on silent videotapes and full audiotape recordings of all 235 nursing staff–patient visits) were completed. Two channels of communication were each rated independently by eight female raters (four per channel) trained to use the rating scale. Each rater assessed all 235 visits on either the visual or vocal channel. Past research in this area has found that in affective judgments of communication in interactions, the evaluations of “naïve judges” (i.e., those who are trained for the first time to do this rating task) are most similar to the evaluations of actual patients after medical visits (Hall, Roter, & Rand, 1981). Four female raters rated the visual nonverbal (video) channel of communication, which focused only on body movement, posture, interactional distance, and not-close facial expressions. Female raters were chosen because past research has demonstrated that female judges are more sensitive judges of nonverbal communication (Ambady, Hallahan, & Rosenthal, 1995). Four separate raters rated the speech with vocal tone channel of communication, which includes both content of speech and tone of voice. The ratings were completed for the entire nursing staff–patient visit ( $M = 4.6$  min,  $SD = 2.15$  min). Each rater received a training session to orient her to the rating scale, and at the start of ratings each received a unique random-ordered list of the interactions so as to counterbalance and prevent biases such as practice and fatigue effects.

The rating scales were developed for the purposes of this study using scales adapted from past research (Charon et al., 1994; DiMatteo et al., 2003); the complete scales are available on request from the corresponding author. A rating format was chosen so as to obtain a global, average measure of the affective and instrumental communication in the visit. The rating format listed unipolar and bipolar adjective pairs (an adjective paired with its opposite and separated by a 6-point scale) describing the nursing staff member and the patient. On the scale between adjective pairs, each rater assessed the affective or socioemotional communicative behaviors (e.g., warm–cold) as well as instrumental or

task-oriented behavior (e.g., competent–incompetent) of the individual rated. Thus, affective behaviors are aspects of socioemotional communication that indicate a caring nursing staff–patient relationship and that may be more likely to be demonstrated through nonverbal messages such as facial expressions or gestures. Instrumental behaviors are technical or task-oriented behaviors that involve the transmission of information, directives, and so forth (Caris-Verhallen et al., 1997; Cegala, 1997). Both types of behaviors were felt to be important because both represent functions of the medical visit (DiMatteo et al., 2003). Based on past literature, the following rating items are considered to be affective: likeable–not likeable, personal–impersonal, friendly–not friendly, sensitive–insensitive, warm–cold, caring–uncaring, and likes–dislikes. The following rating items are considered to be instrumental: active–passive, competent–incompetent, dominant–submissive, interested–uninterested, efficient–inefficient, hurried–not hurried, cooperative–uncooperative, comfortable–uncomfortable, and nervous–relaxed. The ratings were not grouped into these broad categories on the rating sheet, but listed randomly. No *a priori* groupings or composites were assumed.

### Analyses

In the study design, patients ( $N = 235$ ) are “nested” within nursing staff members ( $N = 81$ ). Analyses done at the patient level have considerable power because of the large sample size, but they represent fixed-effects model analyses (Rosenthal & Rosnow, 1991); thus, the findings can be generalized only to the population of patients of the specific 81 nursing staff members in the study sample. A random-effects model allows generalization of the findings not only to the population of patients but to the population of nursing staff as well (Franks et al., 2005; Rosenthal & Rosnow, 1991). Thus, both approaches were taken. Initial analyses were computed at the patient (or interaction) level (with  $N = 235$ ). Then, for nursing staff–level analyses, means were computed for all ratings and satisfaction measures for the patients of each staff member and all analyses were done on those scores at the nurse level (with  $N = 81$ ). Principal components analyses with varimax orthogonal rotation were computed to examine the factor structure of the patient satisfaction items and global ratings (separately for nursing staff and patient, for speech and visual channels). Based on these results, composite variables were created by calculating the mean of the variables in each composite. The variables included in each composite were determined by the factor on which the item had the highest rotated loadings. The composites were not weighted by factor loadings; instead each composite was formed from the mean of the items within it. Pearson product–moment correlations were computed among the composites to examine relationships among the composite measures of satisfaction and the dimensions of global affective and instrumental behavior.

Z tests were used to compare the difference between correlations of communication and satisfaction. Results generated using the patient-level analyses were not substantially different from the nurse-level analyses; thus, for the purposes of brevity and presentation of the more generalizable set of findings, nurse-level (i.e., random-effects model analyses) are presented here.

## RESULTS

### Patient and Health Care Provider Characteristics

This study involves the interactions of 81 nursing staff members with a total of 235 patients for whom both questionnaire and verbal and nonverbal data were available (up to 8 patients per staff member). Patient demographic information was as follows: age ( $M = 45.27$ ,  $SD = 16.8$ , range = 15–86), gender (63% female/36% male), ethnicity (50.4% White, 28.9% Latino, 9.9% Asian, 7% African-American, 2.1% Other), education ( $M = 13.9$  years,  $SD = 2.81$ , range = 2–19), insurance (59.2% HMO, 25.4% PPO, 6.6% MediCal, 4.2% private, 4.7% no insurance or other), and income (4.1% < \$10,000, 7.7% < \$20,000, 18.8% < \$40,000, 28.5% < 70,000, and 40.8% > \$70,000). Nursing staff demographic information was self-reported in a demographic characteristics survey. There were 77 female and 4 male nursing staff members; their ethnic distribution was as follows: Latino (56.6%), African-American (5.3%), White (22.4%), Asian (10.5%), other (5.3%).

### Interrater Reliability Analyses

Interrater reliabilities were calculated to examine the level of agreement among raters of the individual global affective and instrumental variables (using Cronbach’s alpha; Cronbach, 1951). The individual interrater reliabilities for each variable in each channel (speech with vocal tone and visual nonverbal) for both nursing staff and patients are available from the corresponding author. The mean interrater reliabilities for individual item ratings of nursing staff were .46 (speech) and .64 (visual) and of patients were .51 (speech) and .52 (visual). Scale reliabilities for composite ratings, described in more detail following, averaged .80 for the nursing staff and .66 for patients, and are the reliabilities of central concern in the prediction of criterion variables. As is commonly the case, interrater reliabilities of individual global affect ratings, before combination into composites, tend to be of low to moderate size (Rosenthal, 1966, 2005). Although low reliability of a measure can be one explanation for low validity, a minimum level of interrater reliability is not necessary for adequate validity; when validity coefficients are consistently moderate or large in size, low reliability is not a significant concern (Rosenthal & Rosnow, 1991). Individual raters who produce ratings that have low

correlations with each other (and thus low interrater reliability) tend to pick up on different but complementary aspects of the variable they are rating, improving its prediction of outcome variables (in this case, satisfaction).

### Principal Components Analyses and Calculation of Composites

Two principal components accounted for 63% of the variance in 12 items assessing patients' satisfaction with the nursing staff. Based on this, two composites were constructed: Patient Satisfaction With Nursing Staff Interpersonal Behavior (6 items;  $\alpha = .85$ ; Patients' Postvisit Questionnaire items included "patient is satisfied," "nurse is personal," "did not ignore patient," "is friendly," "did not hurry," and "spent enough time") and Patient Satisfaction With Nursing Staff Competence (6 items;  $\alpha = .83$ ; Patients' Postvisit Questionnaire items included "nurse is perfect," "gave complete care," "asked enough questions," "checked everything," "explained," and "patient has no doubts about ability of nurse"). These satisfaction composites were highly correlated with one another ( $r = .75$ ), and although they could be combined, they are examined separately here to distinguish the two dimensions of care. After each visit, nursing staff members completed a rating scale of their satisfaction and comfort with the patient visit. The Cronbach's alpha reliability of this Nursing Staff Satisfaction/Comfort scale is .91. The correlations between nursing staff satisfaction/comfort with the visit and patient satisfaction with nursing staff interpersonal care ( $r = .14$ ) and competence ( $r = .10$ ) were not statistically significant.

Three principal components accounted for 82% of the variance in ratings of nursing staff speech and 77% of the variance in ratings of the nursing staff visual channel. Based on this analysis, three composites were constructed separately for each channel: Caring/Sensitive (8 rating items: caring, comfortable, friendly, likeable, likes the patient, personal, sensitive, warm;  $\alpha = .97$  [speech] and  $.95$  [visual]); Professional (5 rating items: active, competent, dominant, efficient, interested;  $\alpha = .85$  [speech] and  $.74$  [visual]); Negative/Rushed (3 rating items: hurried, nervous, uncooperative;  $\alpha = .72$  [speech] and  $.56$  [visual]). The composites for the different channels were correlated with one another (Caring/Sensitive speech and visual:  $r = .47$ , Professional Manner speech and visual:  $r = .22$ , Negative/Rushed speech and visual:  $r = .30$ , all  $ps < .05$ ). These composites can be characterized as affective (Caring/Sensitive) and instrumental (Professional; Negative/Rushed).

Three principal components accounted for 79% of the variance in ratings of the patient's speech and 74% of the variance in the patient's visual nonverbal channel. Based on this analysis, three composites were constructed for each channel: Pleasant (5 rating items: friendly, likeable, likes the nurse, personal, warm;  $\alpha = .93$  [speech] and  $.92$  [visual]); Involved (6 rating items: active, competent, efficient, interested,

comfortable, nervous;  $\alpha = .81$  [speech] and  $.72$  [visual]); Accommodating (4 rating items: cooperative, sensitive, submissive, hurried;  $\alpha = .34$  [speech] and  $.25$  [visual]). Two of these composites can be characterized as affective (Pleasant) or instrumental (Involved). Accommodating contains items that can be characterized as both instrumental and affective. Multiple regression analyses were not undertaken because of the intercorrelation of the predictors, causing multicollinearity, and because the research questions here are more specifically addressed with careful analyses of the zero-order correlations.

### Correlations

*RQ1a.* Table 1 presents the bivariate correlations between two composites of patient satisfaction and three composite ratings of nursing staff communication in the speech and visual nonverbal channels, allowing us to determine the extent to which affective and instrumental nursing staff behaviors predict their patients' satisfaction. In addition, an average composite of the visual nonverbal and speech with voice tone composites is correlated with the two composites of patient satisfaction. This analysis allows us to look at the visual nonverbal and speech with voice tone composites in combination. Patients were significantly more satisfied with the interpersonal care given by nursing staff whose speech and vocal tone was on average rated as more Caring/Sensitive, more Professional, and less Negative/Rushed. Patient satisfaction with nursing staff members' interpersonal care (on average) was also significantly correlated with ratings of nursing staff members' visual nonverbal communication that were more Caring/Sensitive and less Negative/Rushed in manner. These are quite substantial, with 89% of the correlations reaching significance at the traditional .05 level, and 78% achieving significance at  $p < .01$ .

*RQ1b.* We also sought to determine the difference in magnitude of the correlations of Caring/Sensitive, Professional, and Negative/Rushed speech with vocal tone and visual nonverbal communication. Using the *Z* test, we found no significant differences in the correlations for the two channels; communication in one channel was no more predictive of patient satisfaction with nursing staff than communication in the other (see Table 1 footnotes).

*RQ1c.* This research question addressed whether ratings of affective and instrumental behavior are expressed more strongly through speech with voice tone or through visual nonverbal communication. This question allows us to determine, for example, whether silent visual behavior (including facial expressions and body movements) shows greater caring than does speech with voice tone. Table 2 presents *t* tests for both individual and composite ratings. The affective Caring/Sensitive composite was significantly higher for speech with vocal tone, whereas the instrumental composites of Professional Manner and Negative/Rushed

TABLE 1  
Correlations Between Patient Satisfaction With Nursing Care and Composite Ratings of Two Channels of Nursing Staff Communication (N = 81)

Patient Satisfaction with Nursing Staff	Composite Ratings of Nursing Staff Communication								
	Caring/Sensitive			Professional			Negative/Rushed		
	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>
Interpersonal care	.43**	.33**	.45**	.34**	.20	.36**	-.32**	-.23*	-.34**
Competence	.47**	.29**	.46**	.25*	.35**	.36**	-.42**	-.17	-.37**

Note. Comparisons of correlations between speech with voice tone and visual nonverbal composites in terms of prediction of patient satisfaction were computed using the Z test for the difference between two correlations ( $Z = r_1 - r_2 / \sqrt{(1/N_1 - 3 + 1/N_2 - 3)}$ ). No significant differences were found between the different composites in the two channels. As an example of this overall result, it was found that caring in the visual nonverbal channel is not significantly different from caring in the speech with voice tone channel in prediction of patient satisfaction with nursing staff interpersonal care.

<sup>a</sup>Mean across communication channels. Out of six cases, two are higher when speech with vocal tone and visual nonverbal channels are averaged together than when they are correlated individually.

\* $p < .05$ .

\*\* $p < .01$ .

TABLE 2  
Paired Samples *t*-Tests Illustrating the Difference Between Ratings Items for Nursing Staff for the Visual Channel Compared With Speech

Composites <sup>a</sup>	Visual Nonverbal		Speech With Vocal Tone		<i>t</i> , Significance <sup>b</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Caring/Sensitive	3.73	.49	3.89	.62	-2.46**
Caring	4.54	.51	4.44	.69	1.24 <i>ns</i>
Comfortable	5.09	.42	4.88	.54	2.74**
Friendly	4.43	.64	4.64	.70	-2.64**
Likeable	4.55	.64	4.74	.57	-2.64**
Likes the patient	4.30	.50	4.56	.58	-4.17***
Personal	3.86	.74	4.06	.91	-2.14*
Sensitive	4.51	.54	4.37	.68	1.86 †
Warm	4.22	.59	4.43	.72	-2.57*
Professional Manner	4.43	.31	3.91	.51	8.61***
Competent	5.38	.48	4.92	.47	5.83***
Active	4.75	.48	3.86	.84	8.26***
Dominant	4.65	.37	4.45	.55	2.75**
Efficient	5.15	.46	5.01	.49	1.85 †
Interested	4.52	.63	4.30	.78	2.52*
Negative/Rushed	2.22	.40	1.64	.40	11.09***
Nervous	1.91	.39	2.22	.48	-4.56***
Uncooperative	5.16	.38	5.05	.38	1.9 †
Hurried	2.59	.63	2.74	.59	-1.81 †

<sup>a</sup>Included rating items indented.

<sup>b</sup>*t* tests represent comparison of the visual nonverbal channel with speech/voice tone channel; *df* = 80 for all.

† $p < .10$ .

\* $p < .05$ .

\*\* $p < .01$ .

style were significantly higher for the visual channel. In analyses of individual affective and instrumental items, the following had significantly higher mean ratings in the speech with vocal tone channel: friendly, likeable, likes the nursing

staff member, nervous, personal, and warm (all  $ps < .05$ ); hurried was marginally higher ( $p < .10$ ), approaching traditional significance. The following individual items had significantly higher mean ratings in the visual channel: active, comfortable, competent, dominant, and interested (all  $ps < .05$ ); cooperative, efficient, and sensitive were marginally higher (all  $ps < .10$ ), approaching traditional significance.

**RQ2.** To determine whether patients reflect their satisfaction in their own affective and instrumental behaviors in their speech with voice tone and in their visual nonverbal behaviors, bivariate correlations were computed between two composites of patient satisfaction and three composites of patient communication in the two channels (see Table 3). Patients' satisfaction with interpersonal care from nursing staff was significantly reflected in their speech and visual communication of Pleasant affect, and in their speech communication of Involvement. Patients' satisfaction with their nursing staff members' competence on average was significantly reflected in their speech communication of Pleasant affect and in their visual nonverbal communication of Involvement.

**RQ3.** Table 4 presents the relationship between nursing staff Satisfaction/Comfort with the visit and composite ratings of their own and their patients' affective and instrumental behavior. Nursing staff were on average significantly more satisfied and comfortable with patients whose speech communication was rated as more Pleasant and Involved, and whose visual nonverbal communication was rated as more Accommodating. There was also a trend (approaching traditional significance levels) for more Pleasant patient visual nonverbal communication to correlate with nursing staff members' (average) Satisfaction/Comfort. Also in Table 4, the correlations are presented between nursing staff members' Satisfaction/Comfort and their

TABLE 3  
Correlations Between Patient Satisfaction With Nursing Care and Composite Ratings  
of Two Channels of Patient Communication (N = 81)

Patient Satisfaction With Nursing Staff	Composite Ratings of Patient Communication								
	Pleasant			Involved			Accommodating		
	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>	Speech With Vocal Tone	Visual Nonverbal	Both <sup>a</sup>
Interpersonal care	.32**	.30**	.35**	.29**	.15	.28**	.12	-.12	-.02
Competence	.25*	.20	.26*	.17	.30**	.28**	.01	-.04	-.02

Note. Comparisons of correlations between patient Speech with voice tone and Visual nonverbal composites in terms of prediction of patient satisfaction were computed using the Z formula ( $Z = r_1 - r_2 / \sqrt{(1/N_1 - 3 + 1/N_2 - 3)}$ ). Only one significant difference was found between the different composites in the two channels; specifically, there was a significant difference between correlations of satisfaction with interpersonal care with accommodating speech with vocal tone and visual nonverbal ( $Z = 2.13, p = .016$ ).

<sup>a</sup>Average of composites in both channels. Of six cases, two are higher when speech with voice tone and visual nonverbal are averaged together than when they are correlated individually.

\* $p < .05$ .

\*\* $p < .01$ .

TABLE 4  
Correlations Between Nursing Staff Satisfaction/Comfort and  
Composite Ratings of Two Channels of Patient and Nursing Staff  
Communication (n = 78)

Composite Global Affective Ratings	Nursing Staff Satisfaction/Comfort
Patient communication	
Pleasant (speech with voice tone)	.23*
Involved (speech with voice tone)	.24*
Accommodating (speech with voice tone)	-.03
Pleasant (visual nonverbal)	.19†
Involved (visual nonverbal)	.07
Accommodating (visual nonverbal)	.24*
Nursing staff communication	
Caring/Sensitive (Speech with voice tone)	.26*
Professional manner (Speech with voice tone)	.21
Negative/Rushed (Speech with voice tone)	-.22*
Caring/Sensitive (Visual nonverbal)	.25*
Professional Manner (Visual nonverbal)	.15
Negative/Rushed (Visual nonverbal)	-.20†

† $p < .10$ .

\* $p < .05$ .

speech and visual nonverbal communication to their patients. Nursing staff who were on average more satisfied and comfortable with the visit were rated as more Caring/Sensitive in speech and visual communication, and less Negative/Rushed in speech and visual communication (the latter a trend).

RQ4. Table 5 presents the correlations between nursing staff speech and visual nonverbal affective communication and that of their patients. Overall, the significant correlations among these composites suggest that patients and nursing staff are generally similar in their behavior toward one another, with 24 of the 36 correlations in the table significant at the .01 level, and 3 significant at the .05 level (N = 81).

## DISCUSSION

This study is one of the first empirical investigations of how specific aspects of nursing staff–patient communication relate to the satisfaction of both parties in the primary care interaction. The empirical results presented here contribute to a greater understanding of affective and instrumental communication exchange and the reciprocity of vocal and visual nonverbal behavior in the nursing staff–patient interaction. They also suggest elements of affective and instrumental behavior that may increase both patient and nursing staff satisfaction.

This research has provided robust empirical evidence that the affective communication of nursing staff in the primary care interaction is significantly related to patients’ satisfaction with care. Instrumental communication is also important, and, as would be expected, patients are less satisfied with nursing staff whose communication reflects a more negative tenor. This finding parallels those of the physician–patient communication literature, where affective behavior and contentment with quality of care are interrelated (see, e.g., Bensing & Dronkers, 1992; Hall et al., 1981). Key nursing staff vocal and visual nonverbal behaviors of warmth, positivity, energy, and capability (including their body language, gestures, facial expressions, and vocal tone) are related to patient satisfaction with both competence and interpersonal care. Communicative behaviors were not significantly different between the two communication channels in terms of the prediction of patient satisfaction. Affective behaviors were expressed more strongly through the speech with voice tone channel, and instrumental behaviors were revealed more strongly in the visual nonverbal channel. Vocal tone and the extra-linguistic features of speech have been found consistently in past research to convey affect (LaPlante & Ambady, 2003). Characteristics of caring, warmth, and supportiveness do contribute to

TABLE 5  
Correlations Between Composite Ratings of Nursing Staff and Patients in Two Channels of Communication ( $N = 81$ )

Nursing Staff Composite Ratings	Patient Composite Ratings					
	Visual Nonverbal			Speech With Vocal Tone		
	Pleasant	Involved	Accommodating	Pleasant	Involved	Accommodating
Visual nonverbal						
Caring/Sensitive	.61**	.35**	.13	.34**	.33**	.04
Professional Manner	.44**	.45**	.40**	.31**	.24*	.20
Negative/ Rushed	-.48**	-.55**	-.18	-.40**	-.36**	-.07
Speech with vocal tone						
Caring/Sensitive	.44**	.38**	.05	.63**	.52**	.28*
Professional Manner	.29**	.21	-.11	.63**	.51**	.31**
Negative/ Rushed	-.37**	-.33**	-.07	-.56**	-.48**	-.25*

\* $p < .05$ .

\*\* $p < .01$ .

patients' satisfaction with nursing staff members' capability and interpersonal nature. Not surprisingly, patients are less satisfied with nurses' negativity and hurrying, which may reflect the pressures of limited time in medical visits and could result from staffing levels in primary care. Health care providers may need time to develop rapport with their patients, and, ultimately, effective communication may influence patients' decisions to adhere to their recommended regimens.

Nursing staff members' own satisfaction with the visit is related to the affective nonverbal and verbal behavior of their patients. One might, of course, expect that nursing staff would enjoy working with patients who are involved in their care and who demonstrate positive communicative behaviors. Such satisfaction might eventually be expected to translate into greater provider-patient partnership and more caring behavior on the part of the health professional, as suggested in the correlations here. These findings are particularly interesting in light of what little we know about patients' behavior and nursing staff satisfaction with individual visits compared with the extensive research about larger institutional factors related to nurses' satisfaction with their work.

There appears to be mutual influence between the two participants in the health care exchange. Pleasantness and Involvement from a patient correlates substantially with nursing staff behavior that is Caring/Sensitive, Professional, and less Hurried. These findings reflect the co-occurrence of cooperation and attentiveness, and characteristics of rapport and nonverbal synchrony between patients and nursing staff (Harrigan, Oxman, & Rosenthal, 1985). This article offers evidence that the individuals in dyadic health care interactions demonstrate similar communication behaviors, likely accommodating to each other in their affect, as predicted by communication accommodation theory. Here, more positive speech with vocal tone and visual behaviors by one interactant were met by more positive communication from the other, and although we may not know the

"initiator" of the positive affective behavior, we have evidence that these effects are substantial and may occur partly because of social similarity. Out of 18 possible pairings of nursing staff and patient composite affect variables, two thirds were significant at the .01 level, and 72% met the .05 criterion of significance. In future research using similar methodology with physicians, correlations between physician and patient should be examined to test whether, as might be predicted by communication accommodation theory, such correlations would reflect greater provider-patient social distance and would be lower than those observed here (Hall et al., 1995). Research on therapeutic relationships is far more abundant in psychotherapy settings (Trout & Rosenfeld, 1980) than in the primary care medical setting, despite its importance (Roter et al., 2006).

This research is not without limitations. The correlational design does not allow determination of which of these variables causes the others. "Third variables," ranging from the tenor of the office practice, the values and behavior of the physician(s) by whom the nursing staff are employed, the structure and timing of care, the severity of patients' conditions, and a host of other factors, might influence the affective behavior and the satisfaction of both nursing staff and patients. The robustness of these correlations, however, suggests that there are findings of note here and that future empirical work on these issues should be encouraged. These correlations also suggest that although global ratings of affect have modest interrater reliabilities, their correlations predicting outcomes are consistently robust in size. This is consistent with Guilford's equation for validity (1954, p. 407) demonstrating that interrater reliability is not a prerequisite for validity; different raters may be responding to different, but equally relevant, aspects of the behavior they are rating (Rosenthal, 2005). This work might be furthered by developing even more reliable and valid measures by focusing on fewer and more precisely targeted rating items, giving more detailed directions to raters, and employing a

greater number of raters who are more sensitive and receive more training. This study is also limited by the possibility that nursing staff and patients changed their behavior because they were being recorded. Past research has shown that this is not a significant source of bias, however. Providers and patients become comfortable with recording of the medical visit, and privacy is maintained when clinicians turn the camera or cover the lens during the physical exam (Campbell, Sullivan, & Murray, 1995). Generalizability of these findings to all other patient and provider populations is, of course, uncertain, despite the use of random-effects model analyses. These patients and nursing staff members were part of a health maintenance organization in which most patients had medical insurance, in the ethnically diverse area of Southern California. In addition, the patient population characteristics are skewed toward middle- to upper-middle-class income and higher education (several years beyond high school), so the results may not generalize to patients of different demographic groups. Finally, the providers and patients who participated in this study were volunteers, and generalization of these results to those who would not volunteer should, as in all research, be done with caution.

This research has important implications for the process of primary care medical practice, in which nursing staff play a critical role in communication and patient education. Patient satisfaction measures can be one indicator of an effective health care setting, and these results suggest how the subtleties of patients' communication with members of the health care team *other than the physician* may be centrally related to patient satisfaction. Research on nursing staff and their critical role in patient satisfaction is also imperative in light of the nursing shortage (Bleich et al., 2003). Understanding the effect of rewarding interactions with patients who are involved in their care may be central to the enhancement of nurses' job satisfaction (Agho, 1993). Further, rating methodologies such as those used in this study may prove to be valuable in both the assessment and training of nurses and allied health professionals to enhance their patient-centered care (expressed through verbal and nonverbal messages of warmth, supportiveness, competence, and openness to patient involvement). The use of these methodologies for evaluation and critique of the videotaped behavior of participants, as well as for assessment of communication between health professionals and their patients, may contribute to provider training programs and to further study of the outcomes of the primary care medical visit (Cegala & Lenzmeier Broz, 2002).

Methodologically, this research supports past work on provider-patient communication that has demonstrated more robust and more generalizable findings occurring at the provider level than at the interaction level of analysis (DiMatteo, Hays, & Prince, 1986). (In this research, results generated at the patient level demonstrated comparable findings, but are less generalizable beyond the confines of this sample, and so were not presented.) This work suggests

that future research should be designed with a large enough sample of providers to allow a random-effects model test of the research questions with generalization to a similar population of both patients and providers.

The findings of this study suggest several next steps for this research program and for the field. Future work with this sample will seek to determine how satisfaction and effective communication with nursing staff members influences patients' subsequent communication and satisfaction with their physicians. We hypothesize that when patients are more satisfied with the nursing staff and experience better affective and instrumental communication, they may consequently experience greater satisfaction and improved communication with their physicians. It is also vitally important for research on nurses' job satisfaction to further examine its subtle effects on patients, as well as to assess the effect of patients' behavior on nursing staff members' contentment with their work (Aiken et al., 2002; Ruggiero, 2005). Many studies have explored attitudinal, contextual, and organizational predictors of nursing staff members' satisfaction, but nursing staff-patient mutuality and the role of communication in nursing staff members' responses to patient care has remained an understudied issue of considerable potential value. In this measurement of nurses' satisfaction and comfort with the visit, only 2 items were used (although they demonstrated high scale reliability and correlations with measures of affect). Future research should explore additional aspects of conceptual and measurement relevance to nurses' satisfaction. Future research is also needed to examine nursing staff-patient communication in medical care settings other than primary care (e.g., specialty care, hospital care) and to examine differences according to nursing staff license type. We might speculate that patient satisfaction would be higher with nurses who have more qualifications and more years of experience, but it is possible that the match between patients' and health professionals' social status (including income and education) may be a better predictor of patient satisfaction. It might be fruitful in future empirical research focusing specifically on this issue to examine whether there are differences in affective and instrumental communication as a function of the demographic characteristics of nursing staff members. Also, specific elements of conversation (e.g., question types, topics raised) were not explored here, and future examination of the content of communication is essential to yield greater understanding of factors that influence patient satisfaction with care. We might hypothesize, for instance, that patients will be more satisfied when asked open-ended questions. In addition, examination of the correspondence between nursing staff-patient conversation and physician-patient conversation will provide a further nuanced understanding of the importance of nurses' microsocial interactions with their patients. Future research might include male judges so as to determine whether research findings vary for judges of different genders. Finally, future work should address the

relationships between nursing staff–patient communication and other patient outcomes, including patient adherence and patients’ health status (DiMatteo & Haskard, 2006). Extensions of this research have the potential to ultimately enhance health care outcomes, support the performance of medical teams, and improve the work environment and sense of job fulfillment in nursing care.

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