Published in final edited form as:

Health Commun. 2014 ; 29(6): 563–573. doi:10.1080/10410236.2013.783773.

Nonverbal Accommodation in Healthcare Communication

Thomas A. D'Agostino, M.A. and

Department of Psychiatry and Behavioral Sciences, Memorial Sloan-Kettering Cancer Center,
New York, USA

Carma L. Bylund, Ph.D.

Department of Psychiatry and Behavioral Sciences, Memorial Sloan-Kettering Cancer Center,
New York, USA

Abstract

This exploratory study examined patterns of nonverbal accommodation within healthcare interactions and investigated the impact of communication skills training and gender concordance on nonverbal accommodation behavior. The Nonverbal Accommodation Analysis System (NAAS) was used to code the nonverbal behavior of physicians and patients within 45 oncology consultations. Cases were then placed in one of seven categories based on patterns of accommodation observed across the interaction. Results indicated that across all NAAS behavior categories, physician-patient interactions were most frequently categorized as *Joint Convergence*, followed closely by *Asymmetrical-Patient Convergence*. Among paraverbal behaviors, talk time, interruption, and pausing were most frequently characterized by *Joint Convergence*. Among nonverbal behaviors, eye contact, laughing, and gesturing were most frequently categorized as *Asymmetrical-Physician Convergence*. Differences were predominantly non-significant in terms of accommodation behavior between pre and post-communication skills training interactions. Only gesturing proved significant, with post-communication skills training interactions more likely to be categorized as *Joint Convergence* or *Asymmetrical-Physician Convergence*. No differences in accommodation were noted between gender concordant and non-concordant interactions. The importance of accommodation behavior in healthcare communication is considered from a patient-centered care perspective.

Keywords

healthcare communication; communication accommodation theory; nonverbal behavior

Over the past few decades there has been a well-documented shift from a biomedical or “illness-centered” model of healthcare communication toward a patient-centered approach (Epstein & Street, 2007; McCormack et al., 2011). Many have offered conceptual and operational definitions of patient-centered care (e.g., Cegala & Street, 2009). Patient-centered care requires a flexible physician who is responsive to each patient’s unique

constellation of preferences, concerns, and subjective illness experience, and who uses patient values to guide clinical decisions.

Stewart and colleagues (2003) developed a model of patient-centered competence that consists of six components: exploring both the disease and illness experience, understanding the whole person, finding common ground or mutual understanding, incorporating prevention and health promotion, enhancing the doctor-patient relationship, and being realistic regarding time and resources. Mead and Bower (2000) posited five distinct dimensions of patient-centered care: the biopsychosocial perspective, patient-as-person, sharing of power and responsibility, the therapeutic alliance, and doctor-as-person. Epstein and Street (2007) place communication at the core of patient-centered cancer care. The three central aspects of patient-centered care highlighted include a consideration of patients' needs, perspectives, and individual experiences, provision of opportunities to patients to participate in their care, and enhancement of the physician-patient relationship. McCormack and colleagues (2011) built upon this work to develop a comprehensive inventory of the domains and subdomains that characterize the functions of patient-centered communication in cancer care.

Patient-centered communication measures, and much of the literature on healthcare communication, have been criticized for lacking a solid theoretical foundation (e.g., McCormack et al., 2011). Further, healthcare communication research often follows an interpersonal approach. As noted by Baker, Gallois, Driedger, and Santesso (2011), "Given the strongly role-bound nature of the health care setting, considering the doctor-patient interaction from an *intergroup* perspective can shed further light on how health care providers' and patients' approaches to healthcare are communicated" (p. 379). Communication Accommodation Theory (CAT) is a theoretical approach that can help improve our understanding of healthcare communication, and patient-centered care, by providing a framework for the interplay of intergroup and interpersonal factors. Further, the Nonverbal Accommodation Analysis System (NAAS), a measure of nonverbal accommodation behavior, provides a theoretically grounded method for examining patient-centered communication.

Communication Accommodation Theory

CAT is a general theory of communication that examines interpersonal interactions from an intergroup perspective. CAT seeks to explain the attitudes, motivations, intentions, and identities that interface with social and contextual factors to impact communication choice and outcomes. CAT emerged as social psychologists attempted to account for variations in dialect and word choice depending on one's communication partner (Giles & Powesland, 1975). CAT has since been expanded to encompass a wider range of conversational strategies and a theoretical model of the overall communication process (Coupland, Coupland, Giles, & Henwood, 1988).

CAT proposes that speakers and listeners modify communication behavior to become more similar or different from their partner in interpersonal interactions. In this way, individuals utilize behavioral strategies to *converge* their speech and nonverbal behavior toward and/or

diverge their speech and nonverbal behavior away from others in social interactions. Such behavioral strategies can be understood as a means of conforming or expressing identification. *Convergence* (i.e., matching another's style) is indicative of perceived or desired similarity, whereas *divergence* is associated with a desire to highlight differences (Giles, 2008).

Tajfel and Turner (1986) introduced the distinction between interpersonal and intergroup encounters with the development of Social Identity Theory (SIT). SIT proposes that individuals categorize the social world and self, in part, based on group membership. This includes the respective value and emotional significance attached to particular identifications. Therefore, a distinction is made between interactions influenced by personal characteristics and mood states versus those impacted by social group memberships such as race, religion, geographic region or nation of origin, sexual orientation and so on. A SIT account of intergroup relations is grounded in motivational concerns as individuals desire to maintain a positive social identity, and perceptions and relationships with others are shaped toward this end (Giles, Reid, & Harwood, 2010).

While SIT explores motivations for social group membership and intergroup encounters, CAT aims to predict and explain many of the behavioral adjustments that individuals make to create, maintain, or decrease social distance as personal and social identities emerge and are negotiated while communicating. As noted by Scholl, Wilson, & Hughes (2011), "Identities are not just espoused; they are also communicated and portrayed through communication" (p. 1023). For example, individuals who strongly identify with a particular religion will likely express tenets of that religion and communicate expectations of others and situations based on this identification.

Accommodation and Healthcare Communication

The applicability of CAT to healthcare communication has been noted elsewhere (Baker et al., 2011; Villagran & Sparks, 2010). As posited by Watson and Gallois (1998), in shifting the focus to the patient-as-central, there is a need to examine when and how physicians communicate in intergroup as well as interpersonal terms. To begin, the communication behavior observed between physicians and patients is influenced strongly by the norms attached to their respective roles. Research has demonstrated the power differential between physicians and patients (e.g., Beisecker, 1990). Emanuel and Emanuel (1992) provide a framework through which power relations are expressed in medical visits. Next, Cooper-Patrick and colleagues (1999) investigated the role of race in physician-patient interactions. African American patients rated their consultations as significantly less participatory compared to White patients. Further, patients in race-concordant interactions rated their visits as significantly more participatory compared to those in race-discordant interactions. In another study, international physicians reported using several means of convergence when interacting with patients in order to account for intergroup differences. This included repeating information, changing speaking style, and using nonverbal communication (Jain & Krieger, 2011). Healthcare communication is also influenced by gender, discussed in detail below.

As we have previously argued, CAT is a productive theoretical approach for examining healthcare communication (D'Agostino & Bylund, 2011). While much of the literature has focused solely on physicians' behavior, a CAT approach respects the mutual construction of healthcare interactions. This provides a more complete picture of the process of communication. Next, CAT extends beyond interpersonal variables to include the dynamics of intergroup encounters (Giles, 2008). Finally, CAT recognizes that personal and social identities emerge, and that social distance is managed, through various modes of communication. Recognition of the importance of nonverbal behavior, and research examining it, is often lacking in the literature on healthcare communication (Mast, 2007). Therefore, a theory that addresses this issue by highlighting the importance of both verbal and nonverbal communication, and the interplay between the two, is important.

Accommodation behavior sits at the crux of patient-centered care. Epstein and Street (2007) noted, "One key defining element of effective patient-centered communication is the clinician's ability to monitor and *consciously* adapt communication to meet the patient's needs" (p. 7). Tailoring verbal and nonverbal communication helps align the physician and patient across several important areas including patients' preference for involvement in communication and decision-making, meeting patients' emotional needs, and shared understanding. For example, a physician who reduces the amount of time he or she talks within a patient consultation will likely be allowing the patient more time to present and explore his or her unique illness experience. Accommodation behavior need not be a conscious process. In fact, CAT assumes that accommodation behavior processes often occur outside of conscious awareness. Convergence (i.e., matching another's style) is indicative of perceived or desired similarity, whereas divergence is associated with a desire to highlight differences (Giles, 2008). Therefore, accommodation on either side of the consultation reflects rapport and strengthening of the physician-patient relationship.

Nonverbal Communication in Healthcare Interactions

A research agenda of empirically applying CAT to healthcare communication is a broad undertaking given that CAT accounts for both verbal and nonverbal communication. The current exploratory study focuses on nonverbal communication for several reasons. Despite the importance of nonverbal communication, and its impact on patient and treatment outcomes, it is often overlooked in research on healthcare communication (Mast, 2007). The physician-patient interaction emerges through both verbal and nonverbal channels, and any in-depth understanding of this communication process must include a focus on nonverbal communication (Finset, 2007). It is important to consider not only what is said, but how it is said. For example, emotion is expressed through nonverbal cues in medical interactions and patient-centered communication rests, in part, on physicians' ability to recognize these signals and adjust their communicative behavior to demonstrate understanding and convey a response (Roter, Frankel, Hall, & Sluyter, 2006). In addition, physician-patient matching or reciprocation, closely related to CAT, is largely observed nonverbally (Street & Buller, 1987, 1988). The process by which social group membership impacts and is expressed through nonverbal behavior is well documented (e.g., Dovidio, Hebl, Richeson, & Shelton, 2006). As noted by Dovidio et al. (2006), "...a comprehensive understanding of nonverbal behavior

requires a consideration of the complex processes involved in intergroup as well as intragroup interactions” (p. 496).

A significant number of studies show the importance of nonverbal communication, demonstrating influence on patient and healthcare communication outcomes (see Robinson, 2006). One useful way to categorize nonverbal communication is to distinguish between nonverbal and paraverbal behavior. Nonverbal behavior consists of communicative actions distinct from speech such as facial expressions, gesturing, body posture and positioning (Mehrabian, 2007). Eye contact and mutual gaze are frequently studied in relation to patient-centered communication variables and have been found to impact patient-centeredness (Gorawara-Bhat & Cook, 2011), rapport (Harrigan, Oxman, & Rosenthal, 1985), physician awareness of patients’ psychological distress (Zantinge et al., 2007), and patients’ physical and cognitive functioning (Ambady, Koo, Rosenthal, & Winograd, 2002). Physicians’ proximity and body angle have also been shown to impact healthcare communication and outcomes (Gorawara-Bhat, Cook, & Sachs, 2007). Nonverbal behavior signifying dominance and control negatively impact patient outcomes (Hall, Irish, Roter, Ehrlich, & Miller, 1994; Street & Buller, 1987). Head nodding and gesturing have been associated with inconsistent findings (Duggan & Parrott, 2001; Mast, Hall, Klockner, & Choi, 2008).

Paraverbal behavior refers to a number of implicit aspects of speech such as duration, rate, pauses and errors (Mehrabian, 2007). Findings suggest that patients feel more satisfied when the physician speaks at a similar speed and volume (Ishikawa et al., 2006). Ratings of higher dominance and lower concern in physician tone of voice significantly identified physicians with previous malpractice claims (Ambady, LaPlante, et al., 2002). In another study, patients were most satisfied when the physician used more positive words combined with a more negative tone of voice, suggesting that this combination conveys simultaneous acceptance and concern (Hall, Roter, & Rand, 1981). Interruptions have demonstrated inconsistent findings. Physicians have been shown to interrupt patients more than patients interrupting physicians (West, 1984). Other results suggest no difference (Street & Buller, 1987).

Gender and Patient-Centered Communication

The impact of gender on physician-patient communication represents another layer of the intergroup nature of healthcare interactions. Further, the extent to which a healthcare interaction is patient-centered may be influenced by the gender of the physician and/or the patient. Traditionally the impact of gender on healthcare communication has been studied in two ways. First, physician gender or patient gender has been studied as a main effect. Research to date in this area suggests that female physicians engage in more patient-centered communication behaviors compared to males (e.g., Roter & Hall, 2004). Female physicians have been shown to spend more time with patients, engage in more partnership-building, act less directive, and demonstrate more empathic communication (Elderkin-Thompson & Waitzkin, 1999; Nicolai & Demmel, 2007). Patient behavior also has been shown to vary depending on physicians’ gender. In their meta-analytic review of seven observational studies, Hall & Roter (2002) found patients spoke more, disclosed more biomedical and psychosocial information, and made more positive statements to female physicians. Patients were also more assertive toward female physicians and tended to interrupt them more. Mast,

Hall, Klockner, and Choi (2008) observed that patient satisfaction depends, in part, on the degree to which physicians engage in nonverbal behavior that matches their expected gender role.

Second, researchers have looked at the role of gender concordance in physician-patient pairs. Gender concordance has been associated with greater patient trust in their physician (Bonds, Foley, Dugan, Hall, & Extrom, 2004). Hall et al. (1994) found that physicians and patients contributed equal amounts of talk in female physician/female patient dyads. In contrast, physicians' speech predominated in male physician/male patient visits. Female gender concordant visits also differed affectively, with higher levels of behaviors that facilitate patient self-disclosure noted (e.g., physicians' positive statements and nodding). Male physician/male patient visits have also been described as the least participatory (Kaplan & Greenfield, 1991).

Still, some research on gender and healthcare communication has reported contradictory findings. In one study, male physicians were shown to conduct longer visits, engage in more facilitative communication, and make explicit statements of concern and partnership (Roter, Geller, Bernhardt, Larson, & Doksum, 1999). Schmittiel, Grumbach, Selby, and Quesenberry (2000) found that among patients who chose their physician, females who chose female physicians were the least satisfied and males who chose female physicians were the most satisfied. Bertakis, Franks, and Epstein (2009) found that although gender concordant visits resulted in higher ratings of the patient-centered communication component "understanding the whole person," no significant differences in total patient-centered scores were found.

Communication Skills Training

Communication skills training interventions for healthcare professionals have been shown to be effective in improving providers' communication with patients, and thus their patient-centeredness (Barth & Lannen, 2011; Rao, Anderson, Inui, & Frankel, 2007). Best practices from around the world in communication skills training programs include experiential learning through role play (Kurtz, Silverman, & Draper, 1998). Many effective communication skills training programs have relied on small group role play sessions as a key part of their training. These role plays simulate an actual consultation, using an actor taking the role of a patient (commonly called a simulated patient) (Lane & Rollnick, 2007). Role play provides an opportunity for trainees to practice new skills and receive feedback about their performance from a variety of sources, including their facilitator and others in their small group in addition to watching instant video playback of their interaction with the simulated patient.

At Memorial Sloan-Kettering Cancer Center (MSKCC) healthcare physicians participate in a cancer communication skills training curriculum that has a patient-centered communication skills approach (Bylund et al., 2011). Although verbal and nonverbal accommodation is not directly taught, the topics and skills taught and practiced are focused on tailoring communication to the needs of the individual patient.

Research Questions

Given the relationship between CAT and patient-centered care, an evaluation of nonverbal accommodation will provide a gauge of patient-centered behavior within healthcare interactions. Since, to the best of our knowledge, this exploratory study is the first empirical analysis of nonverbal accommodation in physician-patient interactions, our first research question is a basic descriptive one:

RQ1: What are the patterns of nonverbal accommodation in healthcare interactions?

As discussed above, communication skills training programs may provide increased skills in patient-centeredness. Given the relationship between accommodation behavior and patient-centered communication, it is possible that a communication training intervention will produce detectable changes, reflecting patient-centeredness in nonverbal accommodation behavior:

RQ2: Does participation in a communication skills training program impact nonverbal accommodation?

It is important to also consider intergroup factors that may impact healthcare communication. Given that past research on physician-patient gender concordance has demonstrated an influence on both communication behavior and important patient outcomes, it is possible that gender concordance is associated with nonverbal accommodation:

RQ3: Are there differences in nonverbal accommodation behavior between gender concordant and gender non-concordant physician-patient dyads?

Method

Data

The current sample consisted of 45 oncology consultations recorded as part of the evaluation of a communication skills training program at MSKCC. As part of their participation in the training program, each physician agreed to be video recorded conducting new visit and follow-up consultations before and after the communication intervention. Previous research suggests differences in the way accommodation occurs in new visits compared to follow-ups (Street & Buller, 1988; Waitzkin, 1985). Therefore, only new visits were included in the current exploratory study.

The 45 consultations included 24 individual physicians from the following services: gastrointestinal (20.8%), breast (16.7%), thoracic (12.5%), urology (12.5%), gynecological (8.3%), pain/palliative care (8.3%), lymphoma (4.2%), melanoma/sarcoma (4.2%), pediatrics (4.2%), endocrinology (4.2%), and head/neck (4.2%). The number of consultations per physician ranged from one to four (mean= 1.88). Overall, 12 (50%) physicians were male and 12 (50%) were female. Twenty-four (53.3%) patients were female and 21 (46.7%) were male. Twenty-one (46.7%) of the video recorded consultations included a pre-communication skills training physician and 24 (53.3%) included a post-communication skills training physician.

The communication skills training program consisted of six individual modules with a focus on challenging interactions in oncology (e.g., breaking bad news, discussing prognosis). Each module involved a didactic presentation and small group role play work with standardized patients. The curriculum was skills-focused, with limited attention to nonverbal communication. An overall theme of the curriculum was patient-centeredness (Bylund et al., 2011; Bylund et al., 2010).

Coding

Each consultation was coded using the Nonverbal Accommodation Analysis System (NAAS). Grounded in CAT, the NAAS provides a method for analyzing physician and patient nonverbal accommodation behavior within medical consultations and includes 10 behavior categories (D'Agostino & Bylund, 2011). Detailed descriptions and methods of final code calculation are provided in Table 1. (To obtain a copy of the NAAS coding manual, please contact the first author).

Rather than coding each consultation in full, NAAS behaviors were coded in one-minute segments, including the first two minutes and last two minutes of each consultation. This decision was informed based on CAT and previous methodology used in CAT research. The CAT framework suggests that accommodation strategies are constructed over the course of an interaction. Previous research has employed a method of coding the beginning and end of an interaction in order to measure these within conversation behavior changes as accommodation ensues (Jones, Gallois, Callan, & Barker, 1999). In the current study, the start and end point times of each consultation was determined prior to coding. This method was employed to exclude scripted portions of the interaction that occur at the beginning and end of nearly all medical consultations (e.g., introductions and leave-taking/saying goodbye). (Methods for determining the start and end points are included in the detailed coding manual).

Ten consultations (22.2%) were randomly selected and coded by both authors. The remaining consultations were coded by the first author. In order to assess intra-rater reliability, ten consultations (22.2%) were randomly chosen and re-coded by the first author. All 10 NAAS behaviors demonstrated acceptable levels of inter-rater ($r = .81$ to $r = .96$) and intra-rater agreement ($r = .82$ to $r = 1.0$) with each statistically significant at the $p < 0.01$ level.

A baseline score was calculated for physician-patient dyads across each of the 10 NAAS behavior categories. This served as the comparison point for subsequent movement and consisted of: (1) an average of the physician's NAAS behavior across the pair of minute-long segments at the beginning of the consultation; and (2) an average of the patient's NAAS behavior across the pair of minute-long segments at the beginning of the consultation. Similar to our calculation of the baseline average, an average of each individual's NAAS behavior within the final two minutes was calculated. The latter averages were then compared to their respective baseline averages in order to determine if the individual had converged, diverged, or maintained his or her NAAS behavior. In other words, when thinking about any particular speech act (verbal or nonverbal) from a CAT perspective, an individual can either move toward their conversational partner (i.e. convergence), move away (i.e. divergence), or maintain (i.e. maintenance). Based on comparison to the baseline

measure, we were able to indicate if the physician and patient changed within each NAAS behavior and, if they did change, in which direction. Figure 1 provides a depiction of how accommodation was evaluated, including the potential paths of movement using an example of the NAAS behavior Talk Time.

After determining the movement, or lack of movement, for each physician and patient across the 10 NAAS behaviors, each consultation was placed in one of several categories aimed at describing the accommodation behavior observed. These categories are drawn directly from previous categorizations in CAT literature, including: *Joint Convergence*, *Asymmetrical Convergence*, *Joint Divergence*, *Asymmetrical Divergence*, and *Joint Maintenance*. Each category is depicted in Figure 2. In *Joint Convergence* both the physician and patient demonstrate convergence, moving their nonverbal behavior toward one another. In *Asymmetrical Convergence* only one individual converges. As depicted in Figure 2 this convergence on one side is met by either divergence or maintenance on the other side. Within *Asymmetrical Convergence*, we further categorized cases in order to indicate which individual converged. This resulted in categories of *Asymmetrical-Physician Convergence* and *Asymmetrical-Patient Convergence*.

Joint Divergence refers to instances where both the physician and patient diverge or move their nonverbal behavior away from one another. In *Asymmetrical Divergence* only one individual diverges. As depicted in Figure 2, this divergence is met by maintenance. Within *Asymmetrical Divergence*, we further categorized cases in order to indicate which individual diverged. This resulted in categories of *Asymmetrical-Physician Divergence* and *Asymmetrical-Patient Divergence*. Finally, *Joint Maintenance* refers to instances where both the physician and patient maintain their position and show no movement in behavior from baseline.

Cases in which the physician and patient matched at baseline were removed from the current analysis. In such instances there was no way for either individual to converge and codes of *Joint Convergence* and *Asymmetrical Convergence* become irrelevant. Including these cases would artificially inflate the frequency of *Joint Divergence* and *Asymmetrical Divergence*. Matching cases were present within nine of the ten NAAS categories and ranged from 1 to 31 consultations.

Data Analysis

Data were analyzed using descriptive statistics for RQ1 and Chi-square or Fisher's exact tests of independence for RQ2 and RQ3. The categories describing nonverbal accommodation allowed for several approaches to analyzing the data with tests of independence. Since we were interested in assessing accommodation behavior from a patient-centered theoretical perspective, two sets of tests of independence were conducted. In the first set we viewed *Joint Convergence* as the highest level of patient-centered convergence. A healthcare interaction in which both physician and patient are adjusting their communicative behavior to be more similar to one another may reflect both a desired similarity and an alignment of physician and patient. In the second set of tests of independence, interactions categorized as *Joint Convergence* or *Asymmetrical-Physician Convergence* were included as demonstrating patient-centered convergence. This second set

of analysis adjusts the criteria for patient-centered communication, reducing the impact of patient-related behavior and recognizing that a physician may demonstrate convergence regardless of a patient's response.

Prior to conducting the planned analyses, a series of generalized linear mixed models of the dichotomized outcomes, with random effects of patients clustered within physicians, were conducted in order to account for the nested structure of the data. No significant differences were noted.

Results

Nonverbal Accommodation in Healthcare Communication

RQ1 sought to provide descriptive statistical findings on patterns of accommodation behavior within physician-patient interactions across a number of nonverbal and paraverbal behaviors. Descriptive results are presented in Table 2. Across all NAAS behavior categories, physician-patient interactions were most frequently categorized by *Joint Convergence* (29.9%). This was closely followed by *Asymmetrical-Patient Convergence* (29.3%).

Among paraverbal behaviors, talk time, interruption, and pausing were most frequently characterized by *Joint Convergence* (57.8%, 39.4%, and 35.7% respectively). Simultaneous speech was most frequently categorized as *Asymmetrical-Physician Convergence* (35%) and speech rate was most frequently categorized as *Asymmetrical-Patient Convergence* (54.5%).

Among nonverbal behaviors, eye contact, laughing, and gesturing were most frequently categorized as *Asymmetrical-Physician Convergence* (45.2%, 42.8%, and 41.9% respectively). The NAAS behavior codes smiling and nodding were most frequently categorized as *Asymmetrical-Physician Convergence* (45.5% and 41.9% respectively).

Communication Skills Training and Nonverbal Accommodation

Chi-square and Fisher's exact tests of independence were performed to examine the relationships between training status and nonverbal accommodation behaviors. In the first set of analyses, no significant differences were noted on accommodation behavior across all 10 NAAS behavior categories between communication skills trained and untrained physicians. In the second set of analyses, gesturing in post-communication skills training interactions was more likely to be coded as *Joint Convergence* or *Asymmetrical-Physician Convergence*, $\chi^2(1, N=43) = 3.91, p = .048$. Due to this finding, the NAAS behavior gesturing was excluded from analyses for RQ3 (below). No other significant differences were noted between pre- and post-communication skills training interactions.

Gender Concordance and Nonverbal Accommodation

The predominately null findings of RQ2 allowed us to collapse communication skills training status within our evaluation of gender concordance vs. gender non-concordance for the remaining nine NAAS behavior categories. RQ3 sought to examine potential differences in nonverbal accommodation behavior between gender concordant and gender non-

concordant physician-patient dyads. In both the first and second sets of analyses no significant differences were noted.

Discussion

The current exploratory study was designed to investigate patterns of nonverbal accommodation in healthcare interactions and to examine the impact of gender concordance on nonverbal accommodation behavior. Overall, the healthcare interactions coded present a mixed picture regarding patterns of accommodation. On the one hand, these interactions are high in convergence, with *Joint Convergence* being the most frequently coded category. In addition, when *Joint Convergence* and *Asymmetrical-Physician Convergence* are taken together the percentage of interactions demonstrating convergence, by our definition, reaches 52.5%. Both categories represent instances in which the physician converged his or her nonverbal behavior toward that of the patient. Still, nearly 50% of the interactions were characterized by *Joint Non-Convergence* or *Asymmetrical-Patient Convergence*. This suggests that nearly half of the interactions coded include a physician who did not converge toward the patient's behavior. Taken together, these findings indicate that nonverbal convergence is present to some extent in the nonverbal behavior of physicians in our sample.

For the purposes of the current study we grouped nonverbal communication into two categories used in previous research. This includes paraverbal behavior and nonverbal behavior. There are interesting differences in terms of accommodation behavior between the two. First, *Joint Convergence* was observed most frequently among three of the five paraverbal behaviors. Talk time was the most frequently coded as *Joint Convergence* within paraverbal behaviors, and across all behaviors measured. Pause and interruption were most frequently coded as *Joint Convergence*. These findings have important implications for patient-centered communication in that each behavior is associated with physician dominance. For example, a higher ratio of physician to patient talk predicts lower patient satisfaction (Bertakis, Roter, & Putnam, 1991). Although speculation is limited given the absence of patient outcome measures, it is a positive finding that three behaviors frequently used to express dominance in medical interactions are characterized as *Joint Convergence* in the current study. These results may reflect patient-centered over paternalistic/physician dominant communication. An overarching goal of patient-centered care is a movement away from a paternalistic, and often physician-dominant, style toward a more egalitarian approach that respects the patient as a unique and whole individual with preferences, concerns, and a subjective illness experience that should guide clinical care.

Among the five nonverbal behaviors, laughing, gesturing, and eye contact were most frequently categorized as *Asymmetrical-Patient Convergence*. These findings reflect what is referred to as physician rejecting behavior (Kramer, Ber, & Moore, 1987). Eye contact or physician gaze is an important nonverbal behavior that communicates several pieces of information to a patient. At a minimum, eye contact demonstrates that the physician is engaged and listening to the patient. Eye contact is also important because it alludes to some evidence of a different and important process for patient-centered care in which the physician is attending to emotional and informational cues expressed by the patient. A lack of eye contact convergence may suggest that these patient-centered variables are missing.

Similar problems exist concerning the findings for laughing and gesturing. *Asymmetrical-Patient Convergence* was the most frequently coded category for both NAAS behaviors.

Comparison of accommodation behavior between pre and post-communication skills training interactions proved largely insignificant. Only gesturing was significantly different, with post-training interactions more likely to be categorized as *Joint Convergence* or *Asymmetrical-Physician Convergence*. The predominately null findings for RQ2 are not surprising given the lack of specific focus concerning accommodation and nonverbal behavior within the training curriculum. Although research and theory on patient-centered care guide the communication skills and strategies taught within the intervention, these preliminary findings suggest that more is required to bring about notable changes in nonverbal behavior and convergence. Future efforts should focus on including an emphasis on nonverbal communication within training curriculums as well as information regarding CAT and the impact of accommodation on communication and patient outcomes.

No differences in accommodation were noted between gender concordant and non-concordant interactions. Several factors may help explain the non-significant findings. As noted above, previous research has presented a mixed picture regarding the impact of gender concordance on patient-centeredness and analogous behavior. "Even researchers who have extensively investigated the communicative performance of men and women acknowledge that gender differences, while apparent, are small in magnitude and that male and female clinicians are generally more similar than different in their communication" (Street, 2002, p. 203). Street (2002) posits that gender may influence healthcare communication and outcomes to the extent that gender is linked to predisposing variables and mediators including communication style, goals, intentions, and the way the physician and patient accommodate their partner's communicative behavior during the consultation. Further, gender is one of many inter-group factors that play a role in shaping our communicative behavior and predispositions. Race, ethnicity, age, and education level, to name a few, will all demonstrate varying levels of influence on the way a physician communicates and the degree to which accommodation is likely to occur. The level of data and scope of this exploratory study restricted us from taking a more nuanced look at this issue. Future research efforts should examine the way in which gender interacts with physician communication, response, and accommodation predispositions. Importantly, future research must also include a consideration of the way patient variables (e.g., gender, race, communicative style etc.) meet and interact with the physician variables previously mentioned.

The current study includes several limitations. The sample size was relatively small due to a reliance on previously recorded healthcare consultations and the necessity of adequate camera views of both physicians and patients within those recordings. Next, the current study lacks measurement of patient outcomes and inclusion of verbal behavior. Any comprehensive assessment of patient-centered communication must include an evaluation of the impact of communication on larger outcomes such as patient satisfaction, adherence, and health status. In addition, while nonverbal communication is often overlooked in healthcare communication research, research studies must make an effort to include both verbal and nonverbal channels and the relationship between the two. Although previous research has

demonstrated the ability of using brief segments to make accurate predications regarding larger streams of behavior (Ambady, Bernieri, & Richeson, 2000), this method has yet to be validated in measuring nonverbal accommodation behaviors in healthcare interactions. Future research should focus on determining if accommodation behavior varies across different segments of physician-patient interactions or whether accommodation behavior is consistent throughout medical visits. Next, oncology is a specialized field dealing with serious illness. It is possible that the accommodation behavior of oncologists may differ from that of other specialists or general practitioners in primary care, although it is unclear how or in what ways. Future research should explore the impact of medical specialty on accommodation behavior. Finally, the method of coding used in the current study did not include recording of who initiated each NAAS behavior. Whether a behavior is initiated by the physician or patient may have important influences on accommodation behavior. Future research should examine this relationship.

The current exploratory study reflects, from a theoretical perspective, our initial effort to develop an understanding of accommodation patterns in healthcare interactions. CAT has been established across a number of interpersonal contexts (Giles, 2008; Giles, Coupland, & Coupland, 1991). However, little has been done to examine accommodation within healthcare interactions and its impact on patient-centered care and patient-related outcomes. The few studies that include an analysis of healthcare-related interactions within CAT literature include a focus on the role of nurturing communication in distinguishing interpersonal and intergroup interactions between healthcare professionals and patients (Watson & Gallois, 1998), parents' perceptions of effective and ineffective communication by nurses in a neonatal intensive care unit (Jones, Woodhouse, & Rowe, 2007), intergroup communication between physicians (Hewett, Watson, Gallois, Ward, & Leggett, 2009), and patterns of communication between healthcare providers and patients regarding management of musculoskeletal disorders (Baker et al., 2011). To the best of our knowledge, the current study provides the first descriptive findings on patterns of nonverbal accommodation behavior between physicians and patients in medical consultations. Further, the current sample includes actual physician-patient interactions as opposed to retrospective reviews or simulated encounters.

Beyond the theoretical implications of the current study, a more distal objective is to investigate the degree to which accommodation can be taught as a skill. From a teaching perspective, our aim then becomes determining how physicians can be taught the skills to improve accommodation in healthcare interactions. Further, the extent to which these skills can be acquired and retained through communication training interventions must be explored.

References

- Ambady N, Bernieri FJ, Richeson JA. Toward a histology of social behavior: Judgmental accuracy from thin slices of the behavioral stream. *Advances in Experimental Social Psychology*. 2000; 32:201–271.
- Ambady N, Koo J, Rosenthal R, Winograd CH. Physical therapists' nonverbal communication predicts geriatric patients' health outcomes. *Psychology and Aging*. 2002; 17:443–452. [PubMed: 12243386]

- Ambady N, LaPlante D, Nguyen T, Rosenthal R, Chaumeton N, Levinson W. Surgeons' tone of voice: A clue to malpractice history. *Surgery*. 2002; 132:5–9. [PubMed: 12110787]
- Baker SC, Gallois C, Driedger SM, Santesso N. Communication accommodation and managing musculoskeletal disorders: doctors' and patients' perspectives. *Health Communication*. 2011; 26:379–388. [PubMed: 21424965]
- Barth J, Lannen P. Efficacy of communication skills training courses in oncology: a systematic review and meta-analysis. *Annals of Oncology*. 2011; 22:1030–1040. [PubMed: 20974653]
- Beisecker AE. Patient power in doctor-patient communication: What do we know? *Health Communication*. 1990; 2:105–122.
- Bertakis KD, Franks P, Epstein RM. Patient-centered communication in primary care: Physician and patient gender and gender concordance. *Journal of Womens Health*. 2009; 18:539–545.
- Bertakis KD, Roter D, Putnam SM. The relationship of physician medical interview style to patient satisfaction. *The Journal of Family Practice*. 1991; 32:175–181. [PubMed: 1990046]
- Bonds DE, Foley KL, Dugan E, Hall MA, Extrom P. An exploration of patients' trust in physicians in training. *Journal of Health Care for the Poor and Underserved*. 2004; 15:294–306. [PubMed: 15253380]
- Bylund CL, Brown RF, Bialer PA, Levin TT, Lubrano di Ciccone B, Kissane DW. Developing and Implementing an Advanced Communication Training Program in Oncology at a Comprehensive Cancer Center. *Journal of Cancer Education*. 2011; 26:604–611. [PubMed: 21541813]
- Bylund CL, Brown R, Gueguen JA, Diamond C, Bianculli J, Kissane DW. The implementation and assessment of a comprehensive communication skills training curriculum for oncologists. *Psychooncology*. 2010; 19:583–593. [PubMed: 19484714]
- Cegala, DJ.; Street, RL. Interpersonal dimensions of health communication. In: Berger, C.; Roloff, M.; Roskos-Ewolsen, D., editors. *Handbook of Communication Science* (2nd Edition). Thousand Oaks, CA: Sage; 2009.
- Cooper-Patrick L, Gallo JJ, Gonzales JJ, Vu HT, Powe NR, Nelson C, Ford DE. Race, gender, and partnership in the patient-physician relationship. *The Journal of the American Medical Association*. 1999; 282:583–589. [PubMed: 10450723]
- Coupland N, Coupland J, Giles H, Henwood K. Accommodating the elderly: Invoking and extending a theory. *Language in Society*. 1988; 17:1–41.
- D'Agostino TA, Bylund CL. The nonverbal accommodation analysis system (NAAS): Initial application and evaluation. *Patient Education and Counseling*. 2011; 85:33–39. [PubMed: 20851559]
- Nonverbal communication, race, and intergroup interaction. In: Dovidio, JF.; Hebl, M.; Richeson, JA.; Shelton, JN., editors; Patterson, VMaML., editor. *The SAGE Handbook of Nonverbal Communication*. Thousand Oaks, CA: Sage; 2006.
- Duggan AP, Parrott RL. Physicians' nonverbal rapport building and patients' talk about the subjective component of illness. *Human Communication Research*. 2001; 27:299–311.
- Elderkin-Thompson V, Waitzkin H. Differences in clinical communication by gender. *Journal of General Internal Medicine*. 1999; 14:112–121. [PubMed: 10051782]
- Emanuel EJ, Emanuel LL. Four models of the physician-patient relationship. *The Journal of the American Medical Association*. 1992; 267:2221–2226. [PubMed: 1556799]
- Epstein, RM.; Street, RL. Patient-centered communication in cancer care: Promoting healing and reducing suffering. Bethesda, MD: National Cancer Institute; 2007. NIH Publication No. 07-6225.
- Finset A. Nonverbal communication: An important key to in-depth understanding of provider-patient interaction. *Patient Education and Counseling*. 2007; 66:127–128. [PubMed: 17445744]
- Giles, H. Communication accommodation theory: "When in Rome..." or not!. In: Baxter, LA.; Braithwaite, DO., editors. *Engaging Theories in Interpersonal Communication: Multiple Perspectives*. Thousand Oaks, CA: Sage; 2008. p. 161-173.
- Giles, H.; Coupland, J.; Coupland, N. Contexts of Accommodation: Developments in Applied Sociolinguistics. New York: Cambridge University Press; 1991.
- Giles, H.; Powesland, PF. Speech style and social evaluation. London: Academic Press; 1975.

- Giles, H.; Reid, SA.; Harwood, J. Introducing the dynamics of intergroup communication. In: Giles, H.; Reid, SA.; Harwood, J., editors. *The Dynamics of Intergroup Communication*. New York: Peter Lang Publishing; 2010.
- Gorawara-Bhat R, Cook MA. Eye contact in patient-centered communication. *Patient Education and Counseling*. 2011; 82:442–447. [PubMed: 21211926]
- Gorawara-Bhat R, Cook MA, Sachs GA. Nonverbal communication in doctor-elderly patient transactions (NDEPT): Development of a tool. *Patient Education and Counseling*. 2007; 66:223–234. [PubMed: 17324551]
- Hall JA, Irish JT, Roter DL, Ehrlich CM, Miller LH. Gender in medical encounters: an analysis of physician and patient communication in a primary care setting. *Health Psychology*. 1994; 13:384–392.
- Hall JA, Roter DL. Do patients talk differently to male and female physicians? A meta-analytic review. *Patient Education and Counseling*. 2002; 48:217–224. [PubMed: 12477606]
- Hall JA, Roter DL, Rand CS. Communication of Affect between Patient and Physician. *Journal of Health and Social Behavior*. 1981; 22:18–30. [PubMed: 7240703]
- Harrigan JA, Oxman TE, Rosenthal R. Rapport Expressed through Nonverbal Behavior. *Journal of Nonverbal Behavior*. 1985; 9:95–110.
- Hewett DG, Watson BM, Gallois C, Ward M, Leggett BA. Communication in Medical Records Intergroup Language and Patient Care. *Journal of Language and Social Psychology*. 2009; 28:119–138.
- Ishikawa H, Hashimoto H, Kinoshita M, Fujimori S, Shimizu T, Yano E. Evaluating medical students' non-verbal communication during the objective structured clinical examination. *Medical Education*. 2006; 40:1180–1187. [PubMed: 17118111]
- Jain P, Krieger JL. Moving beyond the language barrier: The communication strategies used by international medical graduates in intercultural medical encounters. *Patient Education and Counseling*. 2011; 84:98–104. [PubMed: 20638218]
- Jones E, Gallois C, Callan V, Barker M. Strategies of accommodation: development of a coding system for conversational interaction. *Journal of Language and Social Psychology*. 1999; 19:123–152.
- Jones L, Woodhouse D, Rowe J. Effective nurse parent communication: A study of parents' perceptions in the NICU environment. *Patient Education and Counseling*. 2007; 69:206–212. [PubMed: 17936549]
- Kaplan SH, Greenfield S. Gender Differences in Physician-Patient Communication for Patients Seeing the Same and Opposite Gender Physicians. *Clinical Research*. 1991; 39:A627–A627.
- Kramer D, Ber R, Moore M. Impact of workshop on students' and physicians' rejecting behaviors in patient interviews. *Journal of Medical Education*. 1987; 62:904–910. [PubMed: 3681918]
- Kurtz, S.; Silverman, J.; Draper, J. *Teaching and learning communication skills in medicine*. Abingdon, Oxon, UK: Radcliffe Medical Press; 1998.
- Lane C, Rollnick S. The use of simulated patients and role-play in communication skills training: A review of the literature to August 2005. *Patient Education and Counseling*. 2007; 67:13–20. [PubMed: 17493780]
- Mast MS. On the importance of nonverbal communication in the physician-patient interaction. *Patient Education and Counseling*. 2007; 67:315–318. [PubMed: 17478072]
- Mast MS, Hall JA, Klockner C, Choi E. Physician Gender Affects How Physician Nonverbal Behavior Is Related to Patient Satisfaction. *Medical Care*. 2008; 46:1212–1218. [PubMed: 19300310]
- McCormack LA, Treiman K, Rupert D, Williams-Piehot P, Nadler E, Arora NK, Street RL Jr. Measuring patient-centered communication in cancer care: a literature review and the development of a systematic approach. *Social Science & Medicine*. 2011; 72:1085–1095. [PubMed: 21376443]
- Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. *Social Science & Medicine*. 2000; 51:1087–1110. [PubMed: 11005395]
- Mehrabian, Albert. *Nonverbal communication*. New Brunswick, NJ: Aldine Transaction; 2007.
- Nicolai J, Demmel R. The impact of gender stereotypes on the evaluation of general practitioners' communication skills: an experimental study using transcripts of physician-patient encounters. *Patient Education and Counseling*. 2007; 69:200–205. [PubMed: 17942269]

- Rao JK, Anderson LA, Inui TS, Frankel RM. Communication interventions make a difference in conversations between physicians and patients: A systematic review of the evidence. *Medical Care*. 2007; 45:340–349. [PubMed: 17496718]
- Robinson, JD. Nonverbal communication and physician-patient interaction. In: Patterson, VMML., editor. *The SAGE Handbook of Nonverbal Communication*. Thousand Oaks, CA: Sage Publications, Inc.; 2006.
- Roter DL, Frankel RM, Hall JA, Sluyter D. The expression of emotion through nonverbal behavior in medical visits - Mechanisms and outcomes. *Journal of General Internal Medicine*. 2006; 21:S28–S34. [PubMed: 16405706]
- Roter DL, Geller G, Bernhardt BA, Larson SM, Doksum T. Effects of obstetrician gender on communication and patient satisfaction. *Obstetrics & Gynecology*. 1999; 93:635–641. [PubMed: 10912958]
- Roter DL, Hall JA. Physician gender and patient-centered communication: a critical review of empirical research. *Annual Review of Public Health*. 2004; 25:497–519.
- Schmittiel J, Grumbach K, Selby JV, Quesenberry CP. Effect of physician and patient gender concordance on patient satisfaction and preventive care practices. *Journal of General Internal Medicine*. 2000; 15:761–769. [PubMed: 11119167]
- Scholl JC, Wilson JB, Hughes PC. Expression of Patients' and Providers' Identities During the Medical Interview. *Qualitative Health Research*. 2011; 21:1022–1032. [PubMed: 21263064]
- Stewart, M.; Brown, JB.; Weston, WW.; McWhinney, IR.; McWilliam, CL.; Freeman, TR. *Patient-Centered Medicine: Transforming the Clinical Method* (2nd Edition). Oxon, UK: Radcliffe Medical Press Ltd.; 2003.
- Street RL. Gender differences in health care provider-patient communication: are they due to style, stereotypes, or accommodation? *Patient Education and Counseling*. 2002; 48:201–206. [PubMed: 12477604]
- Street RL, Buller DB. Nonverbal response patterns in physician-patient interactions: a functional analysis. *Journal of Nonverbal Behavior*. 1987; 11:234–253.
- Street RL, Buller DB. Patients Characteristics Affecting Physician-Patient Nonverbal-Communication. *Human Communication Research*. 1988; 15:60–90.
- Tajfel, H.; Turner, TC. The social identity theory of intergroup behavior. In: Worchel, S.; Austin, WG., editors. *Psychology of intergroup relations*. 2nd. Chicago: Nelson-Hall; 1986.
- Villagran, MC.; Sparks, L. Social identity and health contexts. In: Giles, H.; Reid, S.; Harwood, J., editors. *The Dynamics of Intergroup Communication*. New York: Peter Lang Publishing; 2010. p. 235–248.
- Waitzkin H. Information Giving in Medical-Care. *Journal of Health and Social Behavior*. 1985; 26:81–101. [PubMed: 4031436]
- Watson B, Gallois C. Nurturing communication by health professionals toward patients: A communication accommodation theory approach. *Health Communication*. 1998; 10:343–355. [PubMed: 16370979]
- West C. When the Doctor Is a Lady: Power, Status and Gender in Physician-Patient Encounters. *Symbolic Interaction*. 1984; 7:87–106.
- Zantinge EM, Verhaak PFM, de Bakker DH, Kerssens JJ, van der Meer K, Bensing JM. The workload of general practitioners does not affect their awareness of patients' psychological problems. *Patient Education and Counseling*. 2007; 67:93–99. [PubMed: 17382508]

Figure 1.
Schema of Accommodation Pathways

Explanation	Physician and Patient	
1. Joint Convergence	A →	← B
2. Asymmetrical Convergence	A →	B →
	A →	B
3. Joint Divergence	← A	B →
4. Asymmetrical Divergence	← A	B
5. Joint Maintenance	A	B

Figure 2.
Communication Accommodation Theory Categories

Table 1

NAAS behavior categories.

NAAS Behavior	Description	Code Calculation
<i>Paraverbal</i>		
Talk Time	The proportion of each minute that the physician or patient talks for.	Duration of talk (secs)/60 (secs)
Pause	The proportion of each minute that the physician or patient pauses for.	Duration of pause (secs)/60 (secs)
Simultaneous Speech	Any instance where the first speaker is still speaking when the second speaker begins to speak, but the second speaker does not take the floor from the first speaker. This includes both back channels and unsuccessful interruptions. Proportion per minute calculated for each conversational party.	Duration of simultaneous speech (secs)/60 (secs)
Speech Rate	The pace of speech produced by the physician or patient.	Number of syllables per minute/Duration of talk (secs)
Interruption	Defined as a situation in which the first speaker is still speaking when the second speaker begins to speak, and the second speaker continues speaking while the first speaker stops.	Number of interruptions/Conversational partner's duration of talk (secs)
<i>Non-Verbal</i>		
Smiling	A relaxation of the facial features, with lips parted or closed, and with the corners of the lips turned upward.	Number of smiles/60 (secs)
Laughing	Vocalization, smiling, and movements of face and body that express amusement, exultation, or scorn.	Number of laughs/60 (secs)
Gesturing	Movements of the forearm and hand, where a continuous movement is counted as one movement.	Number of gestures/Duration of talk (secs)
Nodding	Instance of listener feedback, displayed through cyclical or continuous, up/downward or forward/backward motions of the vertical or sagittal plane.	Number of nods/Conversational partner's duration of talk (secs)
Eye Contact	The duration of each minute that the conversational party focuses gaze on their partner's eyes or face.	Duration of eye contact/60 (secs)

Table 2

Accommodation Categories by NAAS Behavior

	Convergence			Joint Maintenance	Non-Convergence		
	Joint Convergence	Asymmetrical-Physician Convergence	Asymmetrical-Patient Convergence		Joint Divergence	Asymmetrical-Physician Divergence	Asymmetrical-Patient Divergence
<i>Paraverbal</i>							
Talk Time (n=45)	26 (57.8%)	2 (4.4%)	4 (8.9%)	0 (0%)	11 (24.4%)	1 (2.2%)	1 (2.2%)
Pause (n=42)	15 (35.7%)	9 (21.4%)	12 (28.6%)	1 (2.4%)	0 (0%)	1 (2.4%)	4 (9.5%)
Simultaneous Speech (n=40)	11 (27.5%)	14 (35%)	8 (20%)	0 (0%)	3 (7.5%)	2 (5%)	2 (5%)
Speech Rate (n=44)	8 (18.2%)	4 (9.1%)	24 (54.5%)	0 (0%)	6 (13.6%)	1 (2.3%)	1 (2.3%)
Interruption (n=33)	13 (39.4%)	7 (21.2%)	4 (12.1%)	1 (3%)	1 (3%)	2 (6.1%)	5 (15.2%)
<i>Non-Verbal</i>							
Smiling (n=22)	1 (4.5%)	10 (45.5%)	7 (31.8%)	1 (4.5%)	0 (0%)	0 (0%)	3 (13.6%)
Laughing (n=14)	2 (14.3%)	2 (14.3%)	6 (42.9%)	3 (21.4%)	0 (0%)	0 (0%)	1 (7.1%)
Gesturing (n=43)	14 (32.6%)	8 (18.6%)	18 (41.9%)	0 (0%)	1 (2.3%)	1 (2.3%)	1 (2.3%)
Nodding (n=43)	9 (20.9%)	18 (41.9%)	6 (14%)	1 (2.3%)	5 (11.6%)	3 (7%)	1 (2.3%)
Eye Contact (n=42)	11 (26.2%)	9 (21.4%)	19 (45.2%)	0 (0%)	3 (7.1%)	0 (0%)	0 (0%)
Total	110 (29.9%)	83 (22.6%)	108 (29.3%)	7 (1.9%)	30 (8.2%)	11 (2.9%)	19 (5.2%)