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The Nonverbal Accommodation Analysis System (NAAS): Initial application and evaluation

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Abstract

Objective—To describe the development, initial application, and evaluation of the Nonverbal Accommodation Analysis System (NAAS). Grounded in Communication Accommodation Theory, this coding system provides a method for analyzing physician and patient nonverbal accommodation behaviors within medical consultations.

Methods—Video recordings of 45 new visit consultations at a comprehensive cancer center were coded using the NAAS. Inter-rater and intra-rater reliability were assessed. For validation purposes, two independent coders rated all consultations for theoretically-related constructs.

Results—The NAAS demonstrated high levels of reliability. Statistically significant correlations were observed across all 10 behavior categories for both inter-rater and intra-rater reliability. Evidence of content and construct validity was also observed.

Conclusion—The current study presents the initial application and evaluation of a coding system meant for analysis of the nonverbal behavior of physicians and patients within medical consultations. The results of this initial trial and psychometric evaluation provide evidence of the NAAS as a valid and reliable nonverbal accommodation coding system.

1. Introduction

The physician-patient interaction is fundamentally an interpersonal interaction. Interpersonal communication theorists believe that interpersonal communication is, by nature, transactional. This means that when people interact, they are affected by and affect each other simultaneously [1]. Despite a large body of research and theory in the field of communication studies, interpersonal communication theories [2] have only infrequently been applied to the physician-patient context. Such theories may help to explain and predict behavior in clinical consultations, ultimately providing guidance on interventions to improve consultations.

Communication Accommodation Theory (CAT) [3–4] focuses on the way in which two people interact, exemplifying the transactional perspective. CAT provides a theoretical framework for predicting and explaining many of the behavioral adjustments that individuals make to create, maintain, or decrease social distance in interaction. For example, individuals will 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. *Convergence*, or matching another's style, is indicative of perceived or desired similarity. *Divergence*, or accentuating differences in style, indicates a desire to highlight differences.

Convergence and divergence are subsumed under the heading, *approximation*, which is one of four accommodation strategies that CAT describes [4]. The remaining strategies include: *interpretability*, involving attending to the other's interpretive competence or ability to understand; *discourse management*, in which speakers judge and respond to the conversational needs of their partner; and *interpersonal control*, relative to role relations in interpersonal communication.

The usefulness of CAT as a potential model for understanding the process of communication within physician-patient interactions has been noted previously [5–6]. Two studies have utilized CAT within medical settings [6–7]. Hewett and colleagues [7] were interested in the role of social identity and intergroup relationships within interspecialty communication among physicians for patients requiring the involvement of multiple specialist departments. Interviews were conducted, thus relying on physician perceptions rather than actual dialogue between physicians. Watson and Gallois [6] explored the role of nurturing communication in distinguishing interpersonal and intergroup interactions between physicians and patients. Although excerpts from actual consultations were used, raters only judged physician verbal behavior. Although valuable, both studies focused on physician behavior, relied on analysis methods not specifically developed for rating accommodation and neglected the role of nonverbal communication.

Accommodation within an interaction is the product of many factors. Given that an individual may have multiple goals during an interaction, he or she may variously accommodate different behaviors. As detailed by Street [5], there are certain areas in which physician and patient behaviors are expected to converge, and other areas that are expected to be characterized by divergence. Information should be exchanged in an egalitarian fashion, developing a shared understanding of the patient's symptoms and illness experience, as well as information regarding disease and treatment. Such shared understanding should be developed while respecting patient concerns and preferences for information, communication, and treatment. Therefore, convergence should be expressed through those behaviors that constitute affiliation and communicative involvement.

Still, the physician-patient relationship is largely a complementary one, with each party differing in their level of medical knowledge and their communicative roles in interacting. The accommodating behaviors of physicians and patients is therefore governed by norms attached to the roles of each, and thus by the intergroup relationships between them. For example, a large extent of research has demonstrated the expression of power and role

relations within medical consultations and the resulting impact on patient outcomes [8–12]. Therefore, divergence should be expressed by means of those behaviors that express role responsibilities and regulate communicative control.

We believe that CAT is a productive theoretical approach for examining medical consultations since it: (1) respects the mutual construction of interactions, focusing on both physicians' and patients' contributions; (2) extends beyond interpersonal variables, including the role of intergroup variables; and (3) recognizes the varying modes through which social distance is managed, including both verbal and nonverbal communication.

1.1. Nonverbal Communication

Although CAT works to explain both verbal and nonverbal communication, our initial work in this area focuses on nonverbal communication. Nonverbal aspects of medical consultations have received less attention [13]. An in-depth understanding of the physician-patient interaction should include an analysis of nonverbal communication [14].

Despite being overshadowed by research on verbal communication within medical encounters, a large extent of literature links nonverbal behaviors to patient, provider and communication outcomes [13, 15]. Gaze orientation and eye contact are frequently studied within physician-patient interactions [16–19]. Gorawara-Bhat, Cook, and Sachs [20] observed that eye contact was the most frequently invoked nonverbal dimension in physician-patient interactions. Harrigan, Oxman, and Rosenthal [21] found that mutual gaze between physician and patient accounted for a significant amount of variance in rapport ratings. High rapport physicians engaged in moderate, but less extensive, eye contact than low rapport physicians. Zantinge et al. [22] observed that eye contact was the strongest predictor of patients' psychological distress, above measurements of empathy, questions, and patient-centeredness. Physical therapists' distancing behavior, as expressed through a pattern of not smiling and looking away from the client, has been correlated with short and long-term decreases in patients' physical and cognitive functioning [23]. Further, level of patient-directed gaze has been shown to vary by culture [24].

While adequate levels of eye contact have been associated with positive outcomes, head nodding, which at a minimum communicates attention, has had mixed findings within research. Harrigan and Rosenthal [25] found a positive correlation between physician head nodding and external raters' perceptions of rapport. Later, Harrigan, Oxman, and Rosenthal [21] found no such association. As discussed by Robinson [15], findings are more robust when nodding is viewed as part of a larger communicative function. For example, Duggan and Parrot [26] observed that physicians expression of encouragement (operationalized as nodding and facial animation) was positively correlated with patients self-disclosure.

Physician gesturing has also been associated with mixed results. Street and Buller [9] found that physicians rated as more gesturally active were perceived as less affiliative, and this was strongly correlated with decreased patient satisfaction with their medical care. In contrast, Mast, Hall, Klockner, and Choi [16] observed that physician gesturing was significantly correlated with patient satisfaction.

Other nonverbal aspects that have demonstrated an influence on medical consultations and outcomes include physicians' proximity to and lean towards patients [20, 27–28], tone of voice [29–30], expressiveness [31], and trunk angle, arm and leg position [25]. Physician direct body orientation has been associated with patient satisfaction and understanding [27], and physicians' psychodiagnostic abilities [32]. Physician indirect body orientation (away from the patient) has been associated with physician dominance ratings by patients [9], and negative rapport ratings [21]. Further, in their systematic review of literature, Beck, Daughtridge, and Sloane [33] identified 16 specific nonverbal behaviors (e.g., physician head nodding, forward lean, and direct body orientation) that were found to be significantly associated with patient satisfaction and compliance.

Nonverbal behaviors believed to signify dominance and control have been shown to negatively impact patient outcomes. Verbal interruptions, by either physician or patient, are a negative predictor of satisfaction [9, 11]. Silence, or within turn pauses, are another means by which a conversational party can express dominance and control. Street and Buller [9] found that patients avoided silence within their speaking turns, while physicians exhibited, and were allowed, substantial within-turn silence (roughly twice that displayed by patients). In another study, analog patients provided less medical information, spoke less, and agreed more when interacting with a high-dominant physician [10]. Surgeons with a more dominant tone of voice are more likely to have had malpractice claims brought against them [34].

1.2. Limitations of Current Work

There is clear evidence that nonverbal communication is extremely important in the physician-patient relationship. What has been missing is a theoretical framework for understanding how these nonverbal communication behaviors indicate either convergence or divergence, strategies that are important in helping us understand accommodation **and implications for physician-patient interaction**.

The most frequently used tools currently available for analyzing physician-patient interactions maintain a verbal focus. The Roter Interaction Analysis System (RIAS) is arguably the most widely used method for coding physician-patient interaction during medical consultations [35]. Other interaction analysis systems include the Cancode interaction analysis system [36], the Verbal Response System [37], and the Medical Interaction Process System (MIPS) [38]. Each of these either fully, or to a large extent, ignores **the** nonverbal aspects of conversational analysis. For example, the MIPS (detailed below) includes two nonverbal categories in which physician and patient affective behavior and body language are rated along global scales. The more extensive verbal portion of the MIPS involves transcribing physician-patient dialogue, followed by assigning each utterance into categories reflecting the motive and context of exchange.

However, some nonverbal analysis tools exist. The Nonverbal Communication in Doctor-Elderly Patient Transactions (NDEPT) is a tool for assessing the salience of physical (including static and dynamic) and kinesic attributes that unfold in the exam room and facilitate or impede interaction [20]. The Relational Communication Scale for Observational Measurement (RCS-O) tracks four nonverbal dimensions of physician-patient communication: intimacy, composure, formality, and dominance [39]. Similar to the RIAS

and MIPS, each item represents a global measure of relational message cues throughout the encounter [14]. However, although these focus on nonverbal behavior, taking a theoretically-informed approach of CAT requires a new method for coding.

1.3. Current Study

The purpose of the current study is to describe the development, initial application and evaluation of a coding system grounded in CAT and meant for analysis of the nonverbal behavior of physicians and patients within medical consultations. This is an important first piece in a larger agenda to better understand accommodation in physician-patient interaction.

2. Methods

2.1 Development of the nonverbal accommodation analysis system

Initial item content was drawn from the nonverbal portion of a CAT coding system developed by Jones, Gallois, Callan, and Barker [40] to examine accommodation in student-student vs. student-faculty member dyads. The nonverbal coding method developed by Jones and colleagues [40] incorporated 11 behaviors including: turn, turn length, response latency, speech rate, short and long pause frequency, interruption frequency, simultaneous speech, smiling, laughing, and gesturing. Each behavior was selected from nonverbal behaviors used in previous research on accommodation [41] and demonstrated acceptable levels of inter-rater and intraclass reliability (α= .90 to .96) [40].

The first author piloted this initial framework on a small sample video recorded oncology consultations. Following this assessment, a review of the literature, and discussion, the authors amended the items and method developed by Jones et al. [40]. All modifications were in an effort to make the coding system more feasible and germane to accommodation with physician-patient interactions. First, the unit of time analysis was adjusted. Jones and colleagues used a minimum unit of 1/10 second for codes requiring a measurement of time duration. The video software available for the purposes of the current study eliminated the possibility of this level of analysis. Therefore, a minimum time measurement unit of 1 second was used. Next, through our initial pilot work, technical limitations made the code *Response Latency* particularly problematic. This code required recording, in units of 1/10 second, the amount of time between when one individual stops talking and the other starts. Since most between-turn gaps are fractions of a second, our newly adopted minimum unit of 1 second, combined with the limitations of our computer software, led us to drop *Response Latency*.

Rather than including codes for both *Turn* and *Turn Length*, a single code of *Talk Time* was created. The proportion of time the physician or patient speaks per minute, can relate to strategies of either complementarity or interpersonal control (e.g. if the physician speaks for a large portion and the patient relatively little) or approximation (e.g. if the rationing of *Talk Time* is more equivalent). We believed that a single code reflecting the duration of talk time for each conversational party was sufficient.

Finally, rather than including codes for both *Short Pause* and *Long Pause Frequency*, which were coded by Jones et al. as within turn pauses less than a minute and greater than a minute respectively, a single code of *Pauses*, which measured the duration of within turn pauses rather than frequency, was used. This adjustment was made for two reasons. First, our change in the unit of time analysis excluded consideration of pauses less than 1 second. Second, we believe that a code providing a more detailed measurement of within turn pause duration would be more sensitive to accommodative strategies and changes as opposed to tallying frequency of pauses and categorizing as short or long pauses.

Following these changes, our revised version of the coding system was piloted on a small sample of consultations to assess feasibility and content. This pilot experience was discussed and examined before the revised NAAS was deemed acceptable. The final version of the NAAS includes 10 nonverbal behaviors. Descriptions of each behavior, as well as the method of final code calculation can be found in Table 1. (For a copy of the detailed coding manual contact the first author)

2.2. Data analysis

Forty-five oncology consultations were coded using the Nonverbal Accommodation Analysis System (NAAS). Each consultation video was recorded as part of the evaluation of a communication skills training program within the Communication Skills Training and Research Laboratory at Memorial Sloan-Kettering Cancer Center [42]. The videos included palliative care and medical, radiation and surgical oncology consultations from a range of services. 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 participation in the training program.

Research suggests that there are differences in the manner in which accommodation occurs in new visits compared to follow-ups [12, 43]. As relationships develop, response and behavioral patterns between the physician and patient are likely to become more idiomatic [44]. As a result, only new visits were selected and used for the purposes of the current NAAS development study. Given the focus on nonverbal communication, each video from the initial pool was screened to exclude consultation recordings that lacked adequate views of both the physician and the patient, and thus could not be sufficiently coded.

The first two minutes and the last two minutes of each consultation were coded. The actual length of each consultation varied from 6 minutes and 50 seconds to 73 minutes and 40 seconds (Mean=25 minutes 37 seconds). Rather than coding the entirety of each consultation, a “thin slice” method was utilized. The term “thin slice” refers to short excerpts of social behavior from which observers can draw inferences about states, traits, and other personally relevant characteristics [45]. Ambady and colleagues [45–47] have presented convincing evidence that, within a research setting, thin slices of behavior provide a great deal of information and permit significantly accurate predictions of outcomes. The choice to use two minute segments at the start and end of each consultation was theoretically-informed. The CAT framework suggests that accommodation strategies (e.g., convergence and divergence) happen over the course of an interaction. Thus, and following

the original coding method from which we modeled the NAAS [40], it was deemed essential to measure both the beginning and end of the consultation.

For the current study, the NAAS was subjected to initial psychometric evaluation procedures. Following the initial pilot described above, the authors collaborated on a final written coding scheme. Ten consultations (22.2%) were selected at random and coded by both authors in order to assess inter-rater reliability. The remaining consultations were coded by the first author. After all 45 consultations were coded, ten consultations (22.2%) were chosen at random, and re-coded by the first author in order to assess intra-rater reliability. Time between initial and second coding ranged from 2 to 6 months.

For validity assessment purposes, two independent coders viewed and rated each of the 45 consultations using the global affective and body language portions of the MIPS. The MIPS was chosen for several reasons. The MIPS [38] is a content analysis system designed and standardized specifically for coding information exchange between physicians and patients within oncology consultations. The primary, verbal portion of the MIPS involves transcribing physician-patient dialogue and assigning each utterance into categories reflecting the motive and content of exchange. The MIPS also includes two global rating components that focus on nonverbal aspects. Seven global affective categories exist focusing on paralinguistic behavior. These include four physician ratings (patient centredness, friendliness, sensitivity, and nervousness) and three patient ratings (anxiety, hostility, and assertiveness). Seven global body language categories exist focusing on kinesthetics. For purposes of this study, we are focusing on each of the seven affective categories and the relevant body language code of eye contact.

3. Results

3.1. Reliability

Pearson correlations were computed to assess inter-rater and intra-rater reliability. The results of these analyses are presented in Table 2. All ten NAAS behaviors demonstrated acceptable levels of inter-rater agreement with all ten statistically significant at the $P<0.01$ level ($r=.81$ to $r=.96$). All ten NAAS behaviors demonstrated acceptable levels of intra-rater agreement with all ten statistically significant at the $P<0.01$ level ($r=.82$ to $r=1.0$).

3.2. Validity

Pearson correlations were computed between each NAAS behavior category and theoretically-related categories from the MIPS affective global rating codes and the body language code of eye contact.

Several statistically significant correlations among NAAS behaviors and MIPS global ratings were observed and are presented in Table 3. For example, patients rated higher on the MIPS global category for assertiveness were significantly more likely to be observed as higher on the NAAS Patient Talk Time category. In other words, patients who observers rated as more assertive tended to talk for longer periods of time. Further, physicians that talked less, made fewer within turn pauses and gestures, had less frequent patient eye contact, had a higher speech rate, and were more likely to engage in simultaneous speech

when interacting with assertive patients. Patients rated more hostile were more likely to be interrupted by the physician. Patients rated more anxious were more likely to nod and to receive physician nodding. Physicians rated as more sensitive were more likely to smile and were more likely to have patients who smile, laugh and nod. Similarly, physicians rated as friendlier were more likely to smile and have patients who smile and nod. Finally, physicians rated as more patient-centered were more likely to smile and have patients who smile, laugh and nod. In addition, many of the correlations that failed to reach statistical significance did indicate trends in the expected direction. For example, patients rated more hostile were less likely to make eye contact with their physicians.

Finally, statistically significant correlations were observed between NAAS **physician** eye contact and the MIPS physician eye contact rating ($r=.447$, $p<0.01$) as well as between NAAS patient eye contact and the MIPS patient eye contact rating ($r=.623$, $p<0.01$).

4. Discussion and Conclusion

4.1. Discussion

Results from this initial evaluation indicate promise for the NAAS as a tool for systematically analyzing the process of nonverbal accommodation within physician-patient interactions. Measures of inter-rater and intra-rater reliability were high across all behavior categories. Such consistency speaks to the quality of the NAAS on two levels. First, intra-rater reliability results rule out concerns of rater drift, which is inherent in some coding methods. A trained coder can consistently rate NAAS behaviors across numerous consultations. Second, inter-rater results demonstrate that the NAAS method can be taught and mastered with little intervention. In the current study, high levels of reliability were achieved after a brief introduction to the NAAS coding manual and dual coding of ten consultations. These high levels of reliability may be due in part to the fact that raters were counting highly specified behaviors rather making personal judgments or ratings of behavioral categories.

Cronbach and Meehl [48] argued that validation procedures can be divided into three categories: (1) criterion-oriented (i.e. concurrent and predictive), (2) content, and (3) construct validity procedures. In this study, we assessed both content and construct validity. The NAAS demonstrates content validity in a few ways. To begin, the behavior content sampled in the coding method was drawn directly from previous research on CAT and nonverbal communication within medical interactions. Through a process of developing and refining the structure of the NAAS, a meaningful attempt was made to best sample those nonverbal behaviors most relevant to CAT, endemic to physician-patient interactions, and most likely to be attuned or adjusted by conversational parties in an effort to negotiate the social distance between themselves and their partner. As detailed above, the nonverbal behaviors that make up the NAAS have been shown to impact a range of outcomes across physician-patient interactions. This includes ratings of rapport and dominance as well as patient outcomes such as satisfaction, understanding and compliance. The statistical analyses conducted relate to evidence of construct validity. Construct validity is demonstrated by the degree to which NAAS behavior categories correlate to those constructs which they theoretically should be related (i.e. convergent validity) and those that

they should theoretically not be related (i.e. discriminant validity). Referring to Table 3, such evidence can be gleaned.

For example, assertive patients demonstrated a theoretically valid pattern of behaviors. One would expect assertive patients to talk more, as they ask more questions, summarize more information, state preferences and concerns, and take a more active role in the communication process. The NAAS category of Patient Talk Time was significantly correlated with the MIPS code of patient assertiveness.

Construct validity was not only demonstrated through correlations with patient assertiveness. Each MIPS affective category correlated significantly with at least one theoretically related NAAS behavior. In addition, although all correlations computed did not reach statistical significance, many displayed statistical trends in the expected direction. For example, a patient-centered consultation is one that demonstrates aspects such as shared understanding, open communication, rapport and respects the patients right to take an active role in the conversation, treatment and planning. In terms of nonverbal behavior this would manifest, in part, through Patient Talk Time. Though statistical significance was not reached, consultations rated high on patient centeredness demonstrated higher levels of the NAAS behavior Patient Talk Time.

Several limitations of the current study should be mentioned. Due to a reliance on previously recorded medical consultations and the necessity of adequate camera views of both physicians and patients within those recordings, the final number of consultations available for coding was less than ideal. Future work should aim to apply the NAAS to larger samples. A larger sample could improve some of the validity results, pushing statistical trends towards significance. Next, the conversational parties observed in this current analysis were predominately Caucasian. Future work should make efforts to apply the NAAS to a variety of interactions involving ethnic and racial minorities. Not only will this effort succeed in focusing on populations that are often neglected in research and intervention, but will help to contribute to the validity of CAT by noting the degree to which intergroup and intragroup variables influence behavioral choices and dynamics.

Another limitation of note is that the current study utilized previously recorded medical consultations from a project that did not collect any other patient or physician data. Effective use of the NAAS to analyze medical interactions from a CAT viewpoint will necessitate the integration of several other pieces of information beyond observed nonverbal behavior. For example, while the NAAS can be used to show how physicians and patients move closer or farther from each other across a range of nonverbal behaviors, collection of information regarding variables such as physician and patient personality characteristics and group identities is crucial to making inferences about the reasons for behavioral choices and accommodation strategies. Finally, the NAAS focuses solely on nonverbal aspects of the medical consultation. A true and comprehensive examination of the physician-patient interaction would combine verbal analysis methods along with the NAAS. Both channels of interaction are indeed at play in the consultation room, interacting and determining outcomes. Future work should make an effort to combine the NAAS with verbal analysis of

accommodation in an attempt to further disseminate the process of communication within medical interactions.

4.2. Conclusion

Although generally overshadowed by the extent of research on verbal behavior, the importance of nonverbal communication within medical consultations has been emphasized for decades [31, 49]. As noted by Robinson [15] the once intangible aspect of physician "bedside manner" is now understood as a range of nonverbal behaviors known to influence patient self-disclosure, satisfaction, and treatment adherence [33].

Still, widespread limitations in the methods of nonverbal research within healthcare exist. As noted above, the systems used to examine physician-patient communication focus **predominantly** on verbal aspects of communication. Since both verbal and nonverbal channels of communication exist within the consultation room, and both are known to impact physician and patient outcomes, systematic methods for nonverbal analysis are needed. Using a theoretically-based analysis system to measure nonverbal accommodation in the physician-patient consultation allows for a more informed approach to understanding such interactions. The results of this initial trial and psychometric evaluation speak to the promise of the NAAS.

We acknowledge that the NAAS is not a comprehensive coding method and note that future work should investigate the degree to which the NAAS behavioral categories fit across diverse medical consultations. Clearly, the next step in this research agenda is an application of the NAAS to measure the convergence/divergence of physicians and patients in clinical consultations.

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Table 1

NAAS Behavior Categories.

Talk Time. (Physician, Patient, and Significant Other) The proportion of each minute that the conversational party talks for.
Pauses. (Physician, Patient, and Sig. Other) The proportion of each minute that the conversational party pauses for.
Simultaneous Speech. (Physician try, Patient try, and Sig. Other try) 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.
Speech rate. (Physician and Patient) Captures the pace of speech by each conversational party. Calculated by dividing the number of syllables a person speaks during a turn by raw Talk Time.
Interruption frequency. (Physician, Patient, and Sig. Other) 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. Proportion of interruption per amount of conversational partner's raw Talk Time is calculated.
Smiling. (Physician and Patient) A relaxation of the facial features, with lips parted or closed, and with the corners of the lips turned upward. Proportion per minute calculated for each conversational party.
Laughing. (Physician and Patient) Vocalization, smiling, and movements of face and body that express amusement, exultation, or scorn. Proportion per minute calculated for each conversational party.
Gesturing. (Physician and Patient) Movements of the forearm and hand, where a continuous movement is counted as one movement. A proportion of Gesturing per raw Talk Time is calculated for each conversational party.
Nodding. (Physician and Patient) Instance of listener feedback, displayed through cyclical or continuous, up/downward or forward/backward motions of the vertical or sagittal plane. Proportion of Nodding per amount of conversational partner's raw Talk Time is calculated for each conversational party.
Eye Contact. (Physician and Patient) The duration of each minute that the conversational party focuses gaze on their partner's eyes or face. Proportion per minute calculated for each conversational party.

Table 2

NAAS Reliability.

	Interrater	Intrarater
Talk Time	.957	.991
Pauses	.826	.818
Simultaneous Speech	.812	.915
Speech Rate	.959	.995
Interruptions	.866	.815
Smiling	.925	.927
Laughing	.874	.893
Gesturing	.885	.942
Nodding	.849	.903
Eye Contact	.888	.915

* All Statistically Significant P<0.01

Table 3

Correlations between the NAAS and MIPS global affective categories (N=45).

	MIPS clinician ratings				MIPS patient ratings		
NAAS Category	***Pt. Centredness***	***Friendliness***	***Sensitivity***	***Nervousness***	***Anxiety***	***Hostility***	***Assertiveness***
Talk Time (MD)	−.064	.181	.186	.154	.059	−.054	−.400**
Talk Time (Pt)	.242	−.013	−.009	−.142	−.104	.027	.416**
Pauses (MD)	−.153	.007	−.121	.072	.114	−.052	−.358*
Pauses (Pt)	.106	−.134	−.172	.043	.121	.184	.277
Interruption (MD)	−.193	−.155	−.205	.209	−.016	.444**	−.010
Interruption (Pt)	.075	−.063	−.084	−.183	−.266	.085	.153
Simultaneous Speech (MD)	.062	−.095	−.163	−.264	−.313*	−.023	.295*
Simultaneous Speech (Pt)	.184	.310*	.358*	.103	.077	.023	−.149
Speech Rate (MD)	.075	−.236	−.105	.103	.129	.030	.374*
Speech Rate (Pt)	.056	.104	.222	.161	.246	−.034	−.134
Eye contact (MD)	.220	.078	.215	.011	.128	−.130	.130
Eye contact (Pt)	−.062	.069	.033	.043	.041	−.281	−.347*
Smile (MD)	.301*	.337*	.305*	−.117	−.120	−.224	.025
Smile (Pt)	.428**	.337*	.466**	.102	−.087	−.178	.227
Laugh (MD)	.173	.135	.044	−.031	−.023	−.129	.088
Laugh (Pt)	.357*	.225	.380*	−.194	−.207	−.223	.185
Nodding (MD)	.056	−.015	.029	.273	.439**	.206	.113
Nodding (Pt)	.339*	.374*	.310*	.273	.439**	−.054	.092
Gesturing (MD)	.000	.244	.116	−.194	−.087	−.306*	−.382*
Gesturing (Pt)	.196	.163	−.070	.046	.038	.085	.166

* P < 0.05

** P< 0.01