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The Roter interaction analysis system (RIAS): utility and flexibility for analysis of medical interactions

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Abstract

The Roter interaction analysis system (RIAS), a method for coding medical dialogue, is widely used in the US and Europe and has been applied to medical exchanges in Asia, Africa, and Latin America. Contributing to its rapid dissemination and adoption is the system's ability to provide reasonable depth, sensitivity, and breadth while maintaining practicality, functional specificity, flexibility, reliability, and predictive validity to a variety of patient and provider outcomes. The purpose of this essay is two-fold. First, to broadly overview the RIAS and to present key capabilities and coding conventions, and secondly to address the extent to which the RIAS is consistent with, or complementary to, linguistic-based techniques of communication analysis.

Keywords: RIAS; Patient–provider communication; Interaction analysis

1. Introduction

The physician–patient relationship has been described since the time of the Greeks; however, systematic study of the medical dialogue is a modern phenomenon. Technological advances have made observation and analysis of large numbers of medical visits feasible, and indeed, the number of empirical studies of doctor–patient communication has grown markedly over the past two decades. The Roter interaction analysis system (RIAS) has emerged over this period as the most widely used single system of medical interaction assessment. It has been used in over 75 communication studies conducted in North America and Europe, Asia, Africa, and Latin America. These studies have described communication in adult and pediatric primary care, emergency medicine, obstetrics and gynecology, oncology, end of life and palliative care, surgery, nursing, podiatry, genetic counseling, family planning services, and dentistry. (See the website www/RIAS.org for an annotated bibliography of RIAS studies.)

The purpose of this essay is to broadly overview RIAS characteristics and to discuss its capabilities and key coding conventions (detailed examples and coding instructions that are presented in the RIAS code manual are not repeated here because of space limitations). We also take this opportunity to address a variety of questions raised by Sandvik et al. in this issue regarding RIAS coding conventions and the system's compatibility with linguistic-based techniques of communication analysis [1].

2. Characteristics of RIAS

The RIAS is derived loosely from social exchange theories related to interpersonal influence, problem solving, and reciprocity [2–6]. It provides a tool for viewing the dynamics of resource exchange between patients and providers through the medical dialogue. The social exchange orientation is consistent with health education and empowerment perspectives that view the medical encounter as a ''meeting between experts'' through which dialogue shapes the therapeutic relationship and reflects patient and provider roles and obligations [7–13]. Conceptually, communication categories can be broadly viewed as reflecting socio–emotional and task-focused elements of medical exchange [13]. Physicians' task-focused behaviors are defined as technically based skills used in problem solving that comprise the base of the ''expertness'' acquired through professional medical education and for which a physician is consulted. From a communication perspective, physicians' task behaviors include those related to performance of medical functions, such as data gathering, tests and procedures, the physical exam, and patient education and counseling. The affective dimension of physician behavior includes those exchanges

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with explicit socio–emotional content related to the building of social and emotional rapport, for instance, the use of social amenities, empathy, concern, or reassurance. These are not generally regarded as behaviors that have been acquired in medical school.

In many ways, patients' communication may be viewed in a parallel fashion. In this regard, Engle's insight into the dual nature of patient motivation for seeking a doctor's care is illuminating; the ''the need to know and understand'' can be viewed in task-focused terms, while the ''need to feel known and understood'' may be better understood in socio–emotional terms [14]. Task-focused communication is reflected largely in patient question-asking and information giving, while the socio–emotional domain includes the expression of concern, optimism, empathy, laughter and joking, and social chit–chat.

Within this theoretical grounding, the RIAS provides a framework of mutually exclusive and exhaustive categories whereby the contributions of both patients and providers to the medical dialogue may be richly elaborated and finely detailed. Moreover, the RIAS shows advantages over other systems in four ways: it is practical, functional, flexible, and methodologically sound with an established record of good reliability and demonstrated predictive validity to a variety of patient and provider outcomes and discriminatory sensitivity to varying medical contexts. These are briefly described, below.

2.1. Practicality

The practical advantages of the RIAS are two-fold. First, coders work directly from the spoken record, usually an audio or videotape. Elimination of the very resource-intensive effort necessary for accurate and full transcription provides a practical and obvious advantage of the RIAS over every other system of interaction analysis based on a written record. Transcription conventions designed to capture linguistic properties of speech, for instance those suggested by Jefferson, are estimated to take many hours of painstaking preparation for each hour of recorded conversation [15]. Not only does RIAS avoid the burden of transcript preparation but, it can be argued, in fact benefits from its absence as the coding conventions at the heart of the system are based on voice tone and phrasing cues that are taken directly from the audio record.

Second, the RIAS is time efficient, both in terms of system mastery and in its application. The system is intuitive and easily learned. Coding rules and operational definitions can be mastered by non-linguists in a relatively short period of extensive training, usually less than a week. High levels of reliability and reasonable coding speed are usually achieved with 6–8 weeks of practice. A well trained RIAS coder can complete the coding of a recording in about twice real time duration of the session. These two characteristics make it both feasible and logistically possible to conduct research that necessitates the coding of large numbers of interactions.

2.2. Functionality

A useful framework for organizing and interpreting RIAS-coded communication in the clinical encounter is a variant of the widely used ''three function model'' of medical interviewing as described by Lazare et al. [16] and Cohen-Cole [17]. While the functional model of medical interviewing is useful, application of the RIAS is not limited to medicine; it has been broadly applied to nursing exchanges, dentistry, podiatry, genetic counseling, and other types of exchange, including a current ongoing study of veterinarian practice.

Task-focused communication, such as question-asking and information giving and counseling, facilitate performance of two medical interview functions: ''gathering data'' to understand the patient's problems and ''educating and counseling'' to provide information to patients about their illness and motivate them to adhere to treatment. Affective behaviors generally reflect the third medical interview function of ''building a relationship'' through the development of rapport and responsiveness to the patient's emotions. A fourth function of the visit, ''activating and partnership building,'' may be added to note the verbal strategies that help patients integrate, synthesize, and translate between the biomedical and psycho–social paradigms of the therapeutic dialogue. Activation strategies (e.g. asking for the patient opinion, asking for understanding, paraphrase and interpretation) facilitate the expression of patients' expectations, preferences, and perspectives so that they may more meaningfully participate in treatment and management decision-making [10,11].

2.3. Flexibility and adaptability

The RIAS is highly adaptable and can be tailored to capture unique contextual dimensions associated with the nature of the medical situation and circumstance studied. Adaptation is evident in its use in oncology [18–24], obstetrics and gynecology [25,26], end of life discussion [27], well-baby care [28], and in studies of delivery of routine care to patients with a particular diagnosis, such as asthma [29], hypertension [30], or diabetes [31,32]. The system's flexibility is reflected in several ways: (a) coding the talk of multiple speakers; (b) the use of targeted sub-categories within the basic RIAS system to document functionally specific kinds of exchange (i.e. anticipatory guidance in pediatric visits or therapeutically-linked lifestyle counseling for such medical conditions as asthma or diabetes); and (c) the elaboration of content-specific topics of interest through structured coder notes and content summaries embedded in the coding record.

2.3.1. Coding multiple speakers

Although most medical exchange is dyadic (patient and provider), it is common for additional participants to contribute to the medical conversation. In these instances, it is

often desirable to capture verbally active third parties. The third party may represent a patient proxy who largely speaks for the patient (for instance, the parent of a young child or a caregiver for a patient with significant cognitive deficit) or the third party may contribute to the conversation in a minor way providing support to the patient. A third party may also be a second health provider (e.g. a consultant, supervisor or nurse) called to the exam room to assist the physician.

The RIAS accommodates the coding of multiple speakers in a variety of ways. A toggle key links codes to speakers with the capability of identifying a patient proxy or companion (as distinct from the patient) and a second health provider. Three way coding has been used in pediatric exchange to distinguish parent from child contributions to the medical dialogue [28,29], in geriatric exchange distinguishing elderly patients from caregivers (Roter, manuscript under review), and in an analysis of a second physician's contribution to the patient–physician dialogue when called in for a consultation [33]. Ongoing studies are investigating the role of supportive companions during the enrollment of patients in clinical trials and the role of a caregiver acting as proxy for a patient with compromised mental capacity.

2.3.2. Targeted sub-categories

The use of targeted sub-categories within the basic RIAS system allows for the documentation of functionally specific exchange linked to the nature of the visit. For instance, routine pediatric visits often include a great deal of ''anticipatory guidance'' talk (i.e. questions, information or counseling relating to normal growth and development issues). It is often of interest to separate this type of talk from other areas of information-giving, counseling and data gathering. Therefore, sub-categories were established (for open and closed questions, information-giving, and counseling) for talk in either of two anticipatory guidance areas—developmental or social. The developmental sub-category includes talk relating to routine and problematic issues in the areas of language, cognitive, motor, and self-help development. The social sub-category includes talk relating to routine and problematic issues in the areas of social development, including parenting, peer relations, and adolescent issues [28].

In a study involving emergency room visits for children presenting with acute asthma attacks, RIAS coding adaptations accommodated a sub-category of questions, information-giving and counseling that relates to the aspect of asthma management that includes talk about lifestyle that is directly linked to the medical condition and/or therapeutic regimen (e.g. talk of smoking, allergens, pets, pollutants, humidifiers, or diet) as opposed to non-clinically linked lifestyle talk [29].

2.3.3. Elaboration of content-specific performance

Content-specific exchange related to provider performance can be monitored through structured coder notes and content summaries embedded in the coding record. This approach extends the coding system's ability to note the discussion of substantive content, as well as to serve as a vehicle for monitoring the adequacy of provider performance in targeted areas. For example, specific information given to the patient regarding his or her therapeutic regimen may be of interest, and the coding record would include a summary of this specific information (i.e. drug name, description, purpose, dose and schedule). Other topics of interest have included the presence or absence of a particular kind of prevention counseling (e.g. diet, smoking, exercise or stress counseling), or whether or not this counseling met criteria for consideration as a brief mention, short discussion, or in-depth counseling. Since this notation is brief, a well-defined area of interest may be reliably abstracted (and marked by digital location stamp) without the laborious process of transcript preparation. In other cases, elaboration may include qualitative assessments of dialogue, including verbatim excerpts of dialogue that are transcribed for later analysis.

Some studies require coding of audio-tapes to ascertain the degree of clinical proficiency demonstrated by the study's physicians. In order to measure proficiency, we have generated checklists based on gold-standard criteria set by experts in the field or a review of the literature. For these studies, coders indicate that specific items are asked or that specific criteria are met during the visit (as evidenced by the tape recording). Once familiar with the items on the proficiency checklist, the coder completes it simultaneously with RIAS coding, assuming the list is not overly complex. For example, proficiency checklists were used in the assessment of physician performance in emergency room treatment of pediatric asthma [34], in discussions of advance directives [27], and in assessment of depression screening [35].

Further evidence of RIAS sensitivity to varying medical contexts is reflected in its utility in capturing the special character of cancer communication. Using RIAS in a series of studies, Ong et al. explored the communication dynamics of Dutch primary care physicians and oncologists with their patients and its effects [18–20]. The RIAS identified significant differences in several domains: oncologists were more verbally dominant, more informative, more attentive, and more expressive of concern to patients than were general practitioners. The study also found that the oncologists were less likely to engage in social exchanges or in persuasive counseling with their patients than the generalists. Inasmuch as these differences were anticipated, considering the serious nature of oncology visits, the findings are interpreted as a validation of the RIAS's discriminatory power and sensitivity to medical context.

2.4. Reliability and validity

The RIAS is characterized by reliability and consistency in coder performance. The RIAS has demonstrated substantial reliability in studies conducted by our own team and others. In our own studies, reliability averages 0.85 for both patient and physician categories based on Pearson correla-

tion coefficients. Other researchers have reported comparable levels of coder reliability. Furthermore, consistent levels of acceptable reliability is especially noteworthy as the system has been translated from its original English to many European languages with consistent success [18,22,25,36]. In addition, there is currently a European Union Communication study using translated versions of the RIAS for coding videotaped primary care encounters in Poland, Rumania, Estonia, and Sweden [37].

The RIAS has generated an evidence base supported by a number of predictive validity studies. The resource-conservative nature of RIAS make it logistically possible to conduct research that accommodates the power estimates and demands for substantial sample sizes of both patients and providers for intervention and evaluative studies. RIAS studies have demonstrated high levels of predictive and concurrent validity. Studies have related aspects of communication to physicians' malpractice experience, physician satisfaction, patient satisfaction, patient recall, and improvement in levels of emotional distress [38–47]. RIAS has also been used to evaluate several types of communication training programs, including those directed toward physicians in training [48,49] and continuing medical education [47,50].

Findings from several studies using RIAS in the cancer setting have related the impact of oncologists' socio–emotional behaviors (both verbal and non-verbal) to patients' satisfaction. Patients report significantly higher satisfaction when oncologists were positive, both verbally and through voice tone [19], when the oncologist used open ended probes allowing more patient input [23], and when the physician was not verbally dominant [24].

3. RIAS and linguistics-based interaction analysis

Sandvik et al. have authored a thoughtful analysis of the RIAS from the perspective of conversation analysis, a particular form of linguistic interaction analysis [1]. In doing so, the authors have raised several broad methodological and measurement issues and have suggested a number of alternatives to RIAS coding conventions. As discussed below, there are tradeoffs for each suggestion and each is considered in regard to practicality, functional utility, coder burden, and conceptual clarity.

Before addressing specific suggestions, however, Sandvik et al. describe their use of RIAS with Observer software for behavior observation and video analysis and discuss the coding advantages that it provides by using digital formats saved to CD ROM. The authors appear unaware of RIAS software capabilities to optimize available technology to support direct coding of digital audio and video file formats. Much like the "Observer" system described by Noldus et al. [51], the RIAS software takes advantage of available digital technology to integrate audio or video records into the software's coding, review, and editing functions. In this context, we have converted analogue video and audio recordings to digital formats (e.g. wav or avi formats) or have directly uploaded digital files from digital recorders to writable CD ROM. The digital records are accessed by RIAS coding software; each coding entry carries a location stamp that reflects the sequential order of the codes in the record, indicates utterance duration, and facilitates coding, editing, and instantaneous review of coded categories and segments.

In a recent pilot study, we have found that use of the review functions provided by the RIAS software was a powerful teaching strategy for self-assessment and directed feedback to residents as part of a training program in communication skills. In this study, residents were videotaped interviewing a simulated patient. These videotapes were saved to CD ROM and the digital files were coded with RIAS software. The preceptors used the CD to structure feedback to the residents on specific skills emphasized in the curriculum and were able to take advantage of the software's ability to provide a summary review and instant retrieval of all RIAS codes, coder notes and special checklists. Evaluation of the program, based on a quantitative assessment of the resident's performance with a second simulated patient one week following the structured feedback, found significant differences in three of the four core competencies that were targeted: increase in data gathering techniques using open-ended questions; increase in problem solving and negotiating skills; and decrease in verbal dominance (paper presented in Barcelona, September 2000, manuscript under review).

A related concern, shared by Sandvick et al. as well as others, is the suggestion that the RIAS is unsuitable for coding interaction sequence. Even prior to the development of digital capabilities as just described, RIAS coding software routinely captured interaction sequence. Each coded utterance is identified by speaker (including third parties) and content category and entered into the record in sequential order. Each code entry is a discrete sequential variable (an average 15 min session can have 500 utterances) with the typical coded record identifying over 500 variables. Since coding produces this record for each interaction, the raw data for sequential analysis is automatically generated. The sequential records, however, are difficult to work with and the large number of variables are routinely reduced and reorganized by code/speaker groupings for analysis. These are the frequency files that are most often presented in published reports.

Exploration of the sequential records has not yet been explored in any meaningful way, as far as we know. The limitations, however, are not in coding, but in theory and methodology to guide analysis. We look forward to strides in this area in the future. Indeed, one could argue that coding is far less a critical issue in the field than are theoretical, statistical, and methodological issues in interaction analysis.

3.1. Specific coding issues

We would like to address several of the specific coding aspects questioned by Sandvik et al. [1].

3.1.1. Turn definition and unitizing speech

As noted, the RIAS is applied to the smallest unit of spoken expression to which a meaningful code can be assigned, generally a complete thought, expressed by each speaker throughout the medical dialogue. A thought unit (or utterance) is operationalized through content, phrasing, speaker, and sequential order in the coding record.

Sandvik et al. note that the definition of turn most commonly used in conversation analysis (''the period of time during which a speaker has the right and obligation to speak'') reflects only speaker shift. Inasmuch as turns are so broadly defined, within-turn detail is lost. Consequently, Sandvik et al. suggest a combination of turn-taking and topic criteria for unitizing speech. The group suggests that speech should be considered a single coding unit while the speaker holds the floor (turn-taking criteria) and sticks to the same topic, regardless of the extent of elaboration (topic criteria). If the speaker changes the topic, his or her turn is segmented into separate utterances, but if multiple utterances are made within a single topic they are represented collectively only once. It appears that the term ''topic'' as used in this context refers to a code change.

This approach is problematic for several reasons. First, the criteria of topic change is too broad to account for complex within-topic variation and is likely to miss important information about the way in which elaboration and emphasis is given to an area. Why wouldn't an analytic system want to track how many statements, or thoughts are made within a topic? If utterance is equated with complete topic elaboration, there is no mechanism for distinguishing turns in which a topic is extensively elaborated from a topic addressed by a single statement. Aside from the missed information regarding emphasis, the ability to compute measures of verbal dominance is compromised. It would no longer be possible to apply a common metric to talk; one thought equals one utterance. It is clear from many observational studies that physicians commonly elaborate within topics to a far greater extent than do patients. This is important information in many respects, including the system's capability to assess verbal dominance and to investigate communication dynamics related to patient education and counseling. Based on these shortcomings, we reject the topic criteria modification suggested by Sandvik at al.

Secondly, Sandvik et al. question the RIAS criteria of a 1 s pause for unitizing speech as arbitrary and unnecessary. Two alternatives are suggested. The first is to emphasize the role of filled and unfilled pauses in the dialogue by coding pauses as events regardless of their length, including pauses as short as two-tenths of 1 s duration. Alternatively, they recommend disregarding pauses altogether with the effect of defining utterance by content and turn, as described above.

Relative to normal phrasing, a full 1 s of silence is notable and sufficiently long to act as a natural break in speech fluency. Furthermore, the utterance following so long a pause (i.e. full 1 s) is likely to reflect some cognitive process, for instance, rephrasing, reconsideration, elaboration, or appraisal. All of these meet the RIAS criterion for representing a distinct thought and separate utterance code. Used in this way, the time delimiter of a full second is a convenient and reliable coding tool for unitizing speech.

In contrast to pronounced pauses, those of very short duration differ in both form and function. Very short pauses appear less as a marker of cognitive processing than as an indicator of speech hesitation. Speech hesitations are extremely common and along with speech errors are generally regarded as indicators of anxiety or nervousness. Indeed, these markers are interesting, but they are time consuming to code with limited utility unless linked to specific questions of interest or hypotheses.

Moreover, the use of global ratings has been shown to capture the emotional tone of the visit, such as anxiety and nervousness. The burden on coders that would result from the demands of coding very short pauses would markedly slow the coding process, introduce a possible source of error, and artificially inflate the frequency of utterances. Finally, there is high utility in using long pauses to demark separate thoughts as expressed as utterances.

We would maintain that the changes in pause criteria do not provide sufficient practical, functional, or conceptual advantages to justify modification of the system in this regard.

3.1.2. Coding back-channels and agreements

Sandvik et al. raise several issues regarding the coding of back-channels and agreements. Two points are made. First is the suggestion that a clearer distinction between back-channels and agreements would result from coding criteria that include some aspect of turn construction. Second is the suggestion that back-channels should be coded for patient speech, just as it is for the doctor. We disagree on both points and believe that the authors have misunderstood or misinterpreted our code manual.

Back-channels are defined as the ''undertalk'' that a listener embeds within a speaker's narrative, signaling interest, attentiveness and the expectation that the speaker should continue. It does not necessarily imply agreement or acceptance of the ideas being expressed, only attentiveness. Back-channels should not be interpreted as signals that the listener wants to take over the floor or to signal the listener's evaluation or interpretation of what is being said, as suggested (Ref. 1, page 340) these signals are coded more appropriately into other categories, for example, ''agreements'' which signal acceptance and accord. By definition, back-channels are never coded at the completion of a speaker's turn and do not mark a floor shift. Agreements, however, are a more versatile code and may be embedded by the listener within a speaker turn or coded at a floor shift.

The distinction between the functions of back-channels and agreements are perhaps further clarified by our rationale for not coding patient back-channels. From a theoretical perspective, the function of back-channels is to encourage a speaker to continue a speech stream through cues of interest

and attentiveness. The withholding of back-channels is an effective mechanism for bringing communication to an abrupt end. As an illustration, think about how difficult it is to continue speech on the telephone when the recipient maintains silence. Of course, as noted by Sandvik et al., physicians may also be affected by facilitating responses from the patient, but not to the same extent as are patients. Physicians commonly deliver long blocks of speech to patients, often within the context of instruction regarding treatment options, drug or lifestyle regimen adherence, or preventive practices. While some patient utterances during these rather long speech streams may be back-channels, the primary function and message of the patient's embedded utterances is agreement and acceptance. Patients' utterances of ''OK'' ''mmm-huh'' ''yeah'' and ''right'' can be interpreted as ''I'm with you, I understand,'' or ''that's right, what you are saying is true,'' rather than an uncommitted encouragement to continue talking. Indeed, physicians often interject pauses into their monologue to make explicit the patient's acceptance of their communication, sometimes using techniques such as asking for patient understanding (are you with me?) and waiting for an explicit reply (yes, go on) before proceeding. Patients, in contrast to their physicians, are much less likely to speak at length without explicit facilitating cues from the physician to encourage continuation or elaboration of their narrative. The well cited finding by Beckman and Frankel testify to this effect: patients' statements regarding the reason for their visit were stopped and redirected by physician questioning after an average length of only 18 s. Moreover, no patient in the study continued speaking, even with facilitators, for longer than 2 min [52].

Because of the recognized importance of back-channels, as expressed by the physician for the facilitation of the patient narrative, these are explicitly coded and distinguished from agreements. Since the patient's expression of back-channels is less critical to the continuation of physician speech, and because the function of those minimal responses embedded by the patient within a physician–speaker turn is more likely to reflect agreement rather than a true back-channel, a reliable distinction between these two types of patient expressions is especially problematic. Therefore, for the patient speaker, back-channel responses are considered a sub-set of the larger agreement category.

We feel that achieving a reliable coding distinction between back-channels and agreements for patient talk is time consuming and burdensome, without sufficient practical, functional, or conceptual advantage.

3.1.3. Distinguishing question form

Sandvik et al. suggest that a completely sequential perspective be taken in defining the form of a question—that is, that the coding of a question form as either open or closed-ended should be based entirely on the listener's response. We do not agree.

The coding of question form is complex and significant. There are many ways in which a question can be asked and the nature of an answer is often shaped by the form of the question prompting the response. Close-ended questions generally produce focused and curtailed responses, often within a yes–no or single word structure, while open questions allow greater respondent discretion and a more detailed response. This, however, is not always the case. Open-ended questions sometimes elicit only single word responses, while closed-ended questions can prompt long, broad narratives. If the criterion for distinguishing close-ended from open questions were solely the nature of the response, important information about the structure of data gathering attempts would be lost. How to structure data gathering, particularly the use of open to close-ended question cones, is identified as a key data gathering skill that is often the target of interview training curricula [17]. Understanding the contexts within which data gathering approaches are more or less successful is critical to mastering the interviewing process. Thus, sequential criteria alone, as suggested by Sandvik et al., would be inadequate in capturing the fullness and the dynamics of data gathering attempts, and would diminish the utility of the system to give feedback to providers on their use of recommended strategies.

How else, then, might question form be identified, if not according to sequential criteria? The RIAS code manual suggests that both the semantic structure of the question, as well as voice tone and phrasing, are critical coding cues. The semantic structure typically defines the question form and there are a variety of key words that are useful in this regard. For instance, words such as ''what, how, why, or could'' generally suggest the intention of non-specific probing, thus indicating an open question. In contrast, words such as ''when, where, how many, or how long'' suggest more directed and focused inquiry. While useful, key words cannot be considered the sole or definitive indicator of question form. Grammatical rules are frequently discarded in spoken exchanges, and ambiguity and confusion would prevail if not for the additional cues to meaning that are derived from voice tone and phrasing.

Sandvik et al. provide two examples of questions and ask how clues to the speaker's intention could be derived, if not from the listener's response. In the first example, the doctor asks ''can you manage to put things behind you now, do you think?'' While it is possible for the patient to provide a limited response (yes or no) to this question, it is likely and expected that he or she would continue with elaborating information. There are several clues to the physician's open-ended intent. First, the way in which the question is worded suggests probing, most importantly by the tag attached to the question, explicitly opening inquiry and expressing interest in the patient's thought process. At this point, the appropriate RIAS code is ''asks opinion,'' a specific kind of open probe characterized by asking for patient judgment, evaluation, or preference. Other clues to the open nature of this inquiry may also be present. The tone of voice and phrasing of the

question could provide important clues to intention. A good guess, in this instance, is that intonation of the question was slow and prolonged and the phrasing was hesitant with several micro-pauses (of course, the tape rather than the transcript is the best source for this judgment). In this instance, even if the patient responded to the question with a one-word response, the intent of the question would still be regarded as open and non-specific.

The second example posed by Sandvik et al. is ''no worries?'' In this case, the semantic presentation is that of a closed-ended question because the question structure is leading; leading questions suggest an anticipated answer, and by their nature are specific and limited in focus. The single word response in this instance happens to be consistent with coding of the question as close-ended. However, even if the patient responded with a detailed narrative about his/her worries, it would still be coded as a close-ended question. The topical emphasis is, of course, within the psycho–social domain. This discussion does not suggest that sequential criteria is not useful as a cue to question form, but we would maintain that it is most useful only when there is continued uncertainty after the syntactic presentation, voice tone, and phrasing of the question have been considered.

In conclusion, we would argue against the suggested change in question form criteria, as important distinctions in the ways in which physicians attempt data gathering would be lost.

3.2. Questions regarding non-coded expressions

Sandvik et al. have asked us to comment on several speech elements that are not currently coded, particularly interruptions, crying, and the empathic process.

3.2.1. Coding interruptive speech

As noted, interruption is a frequent conversational phenomenon. The meaning associated with interruptions has been controversial and somewhat contradictory, sometimes being regarded as a mechanism of verbal dominance by which a speaker steals the floor to direct and control the conversation [53] or as a proxy for interest and engagement [54].

Based on an analysis of interruptions in medical visits by Irish and Hall [54], the RIAS has the capacity to distinguish two broad forms of interruption: (a) simultaneous speech (overlaps) and (b) interruptive speech. These forms are largely linked to their functions. Speech overlaps occur when one speaker anticipates that the first speaker is finishing his/her utterance and begins to speak prematurely without intent to disrupt or cut off the first speaker. The nature of overlap is non-disruptive and does not change the first speaker's thought, focus, or direction. Interruptive speech is operationalized as premature termination of a speaker's statement or thought, while the interrupter interjects a new direction, topic, or focus. The nature of this speech is disruptive and designed to redirect the topic by taking the floor.

The RIAS software includes a toggle function that allows notation of interruption as an editing note in the record, and further identify the nature of the interruption. While we have the capacity to use this notation device, it is time consuming and its use is limited to studies that justify the additional coder time and attention to the marking of interruptive speech.

3.2.2. Crying and demonstrations of distress

Sandvik et al. note that crying is not listed as a distinct category. This is correct. Expressions of pain and bursts of sobbing are registered as utterances of concern with a note embedded into the coding record to mark the event. The coder note will briefly describe the circumstance (e.g. ''patient crying when talking of her divorce,'' or ''patient cried out with pain when examined''). When crying or whimpering is ongoing throughout the visit, as is sometimes the case in pediatric visits, it is noted but not recorded as distinct utterances, as they are difficult to unitize. Crying bursts by adults, or heavy sighs indicating sobbing or pain are recorded under the concern category.

The use of the global affect ratings to reflect the expression of emotional distress, sadness, or pain can be used in concert with coder notes to paint a rich picture of the overall emotional dynamics of the visit.

3.2.3. The empathic process

Empathy is operationally defined in the RIAS manual as statements that paraphrase, interpret, recognize or name the other's emotional state. (Sandvik et al. are incorrect in suggesting that empathy is coded only as an element of physician speech. It has always been included for both speakers in our coding manual.) The emphasis in the definition is on a direct naming of the other's emotional state. As noted by Sandvik et al., there are many other RIAS codes that also reflect emotionally-relevant talk, including such categories as ''legitimize,'' ''reassures/ shows optimism,'' and ''concern''. Each of these codes has a unique operational definition and represents a distinct aspect of emotional exchange, but also share meaning and function.

What is done with these individual codes is an analytic and interpretational challenge, not a coding issue. Indeed, many researchers have combined individual codes in a variety of ways to reflect broader and more subsuming constructs than reflected by each component. The observation by Sandvik et al. that several of the other RIAS categories can express aspects of empathic understanding, including questions about psycho–social issues, is indeed a true and positive reflection of the system's flexibility. There is no reason why psycho–social questions could not, for some purposes, be included in a rapport-building cluster since they reflect an interest in the patient's psychological well being. This, however, may not always be useful. As noted earlier, the composition of composites should be left to investigator discretion depending on both theoretical assumptions and psychometric properties of the communication in a

given study. Why hamstring investigators by limiting their ability to construct and explore novel composites?

Inclusion of a code element in a composite does not imply that the syntactic form is meaningless, as Sandvik et al. suggest. In this regard, we cannot disagree more with the contention that the question ''any cause for increased stress?'' is functionally and pragmatically the same as the statement ''this is distressing for you, I understand.''

4. Conclusions

Just because a variable can be measured does not necessarily mean that it can provide meaning; conversely, failing to adequately capture a phenomenon does not mean that it lacks significance. Before we can specify what can or should be measured, we must ask ourselves why particular communication variables merit measurement, and where do the variables fit in a broader conceptual and theoretical framework? A weakness that is evident in research endeavors relative to medical communication is a limited (or often absent) theoretical focus to guide investigators in making basic judgments regarding what to measure, when, and why. This deficit has contributed to the largely exploratory nature of work in this field with little conceptual framing of results.

The primary challenge, then, is to develop insight by deepening our inquiry and going beyond what has been comfortably done in the past. This can be best done by bridging the schism between qualitative and quantitative methods—it is only in crossing domains that real innovation in measurement and appreciation of meaning might be realized. In this light, we appreciate the valuable discourse of Sandvik et al., as well as the work of the many other researchers who have attempted to find common ground across disciplines and paradigms. We look forward to future exchange and discourse on the many issues related to the capture of interaction dynamics that we all care about so deeply.

5. Note

Our website RIAS.org welcomes visitors interested in posting RIAS-related studies and abstracts, sharing experience in using and adapting the RIAS, and to view the coding manual. Also available on the website is information regarding our software, training, and bibliographic abstracts of studies that have used the RIAS.

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