A method for communication analysis in prosthodontics

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Particularly in prosthodontics, in which the issues of esthetic preferences and possibilities are abundant, improved knowledge about dentist–patient communication during clinical encounters is important. Because previous studies on communication used different methods and patient materials, the results are difficult to evaluate. There is, therefore, a need for methodologic development. One method that makes it possible to quantitatively describe different interaction behaviors during clinical encounters is the Roter Method of Interaction Process Analysis (RIAS). Since the method was developed in the USA for use in the medical context, a translation of the method into Swedish and a modification of the categories for use in prosthodontics were necessary. The revised manual was used to code 10 audio recordings of dentist–patient encounters at a specialist clinic for prosthodontics. No major alterations of the RIAS manual were made during the translation and modification. The study shows that it is possible to distinguish patterns of communication in audio-recorded dentist–patient encounters. The method also made the identification of different interaction profiles possible. These profiles distinguished well among the audio-recorded encounters. The coding procedures were tested for intra-rater reliability and found to be 97% for utterance classification and $\lambda = 0.76$ for categorization definition. It was concluded that the revised RIAS method is applicable in communication studies in prosthodontics. □ *Dentist–patient communication; dentist–patient relationship; interaction analysis*

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In clinical situations communication between the patient and the health care professional is of principal importance. The structure, extent, and content of the patient's participation in the communication process during medical encounters affect both the treatment outcome and the patient's treatment satisfaction (1–5). This also holds true for dental situations, which, however, have their own frame of reference (6). The dental consultation comprises all the functions of a medical consultation and is in addition the occasion when treatment actually is performed. The treatment is commonly associated with uncomfortable feelings in the patient, such as pain and stress. Furthermore, treatment is carried out in the mouth, an area not only necessary for verbal expression but also extremely sensitive and highly charged with emotional significance (7). The conditions in the mouth also have an overall significance for the quality of life (8, 9).

In prosthodontics esthetic issues—what is possible versus what is advisable—are common and often of major importance, making the consideration of patient desire and anticipation necessary to achieve a satisfactory treatment result. The extensive treatment procedures performed in the patient's mouth during prosthodontic rehabilitation are also facilitated by a calm, well-informed, and cooperative patient. Communication is an essential means of ensuring that these prerequisites for a successful treatment outcome are met. It is therefore important to increase knowledge about communication during clinical encounters in prosthodontics.

Analyses of communication during clinical encounters make it possible to identify the different communicative behaviors of the participants (10) and to assess how and to what extent these behaviors have consequences for the outcome of the care and the healing processes. Few studies, however, have been published that analyze audio recordings of communication during dental encounters. These few studies conclude that verbal greetings are only a minor part of an ordinary dental appointment, that patients are activated by much 'everyday talk', and that patients memorize information better if the dentists talk to them in a friendly way and allow them to act as partners during the encounter (11–13). They also show that in sessions with uncooperative patients, only one-quarter of the encounter time is devoted to verbal communication (14). The dentists talked more than the patients during all these encounters. In a recent questionnaire study of a group of Finnish dental patients, clear discrepancies were found between the patient's expectations of the 'ideal' dentist communication and the actual experiences of the dentist's communication skills (15).

Findings like these illustrate the importance of communication, but the studies were performed in different settings with different methods and patient materials, which often makes interpretation and systematic comparison rather difficult. There is therefore a need for further studies of communication during dental encounters, beginning with methodologic development. Such advances have already been made in the medical context.

One method for communication analysis, the Roter Method of Interaction Process Analysis (RIAS) (16), has

Table 1. Roter's categories for interaction analysis as presented in the 1993 RIAS manual. All patient and physician dialogue is coded in categories that may be applied to each speaker, although some categories may be more common to a particular speaker. The categories are tailored to directly reflect the content and context of the routine dialogue between patients and physicians during medical exchange

Physician	Patient
Socioemotional exchange:	
1. Personal remarks, social conversation	1. Personal remarks, social conversation
2. Laughs, tells jokes	2. Laughs, tells jokes
3. Shows approval–direct	3. Shows approval–direct
4. Give compliment–general	4. Give compliment–general
5. Shows agreement or understanding	5. Shows agreement or understanding
6. Back-channel responses	–
7. Paraphrase/check for understanding	7. Paraphrase/check for understanding
8. Empathy	8. Empathy
9. Shows concern or worry	9. Shows concern or worry
10. Reassures, encourages, shows optimism	10. Reassures, encourages, shows optimism
11. Legitimizes	11. Legitimizes
12. Self-disclosure	–
13. Partnership-building	–
14. Shows disapproval–direct	14. Shows disapproval–direct
15. Shows criticism–general	15. Shows criticism–general
16. Asks for reassurance	16. Asks for reassurance
Task-focused exchange	
17. Transition words	17. Transition words
18. Gives orientations, instructions	18. Gives orientations, instructions
19. Bid for repetition	19. Bid for repetition
20. Asks for understanding	20. Asks for understanding
21. Asks for opinion	–
22. Asks questions (close-ended)–Medical condition	22. Asks questions (close-ended)–Medical condition
23. Asks questions (close-ended)–Therapeutic regimen	23. Asks questions (close-ended)–Therapeutic regimen
24. Asks questions (close-ended)–Lifestyle	24. Asks questions (close-ended)–Lifestyle
25. Asks questions (close-ended)–Psychosocial feelings	25. Asks questions (close-ended)–Psychosocial feelings
26. Asks questions (close-ended)–Other	26. Asks questions (close-ended)–Other
27. Asks questions (open-ended)–Medical conditions	27. Asks questions (open-ended)–Medical conditions
28. Asks questions (open-ended)–Therapeutic regimen	28. Asks questions (open-ended)–Therapeutic regimen
29. Asks questions (open-ended)–Lifestyle	29. Asks questions (open-ended)–Lifestyle
30. Asks questions (open-ended)–Psychosocial feelings	30. Asks questions (open-ended)–Psychosocial feelings
31. Asks questions (open-ended)–Other	31. Asks questions (open-ended)–Other
32. Gives information–Medical condition	32. Gives information–Medical condition
33. Gives information–Therapeutic regimen	33. Gives information–Therapeutic regimen
34. Gives information–Lifestyle	34. Gives information–Lifestyle
	35. Gives information–Psychosocial
–	
36. Gives information–Other	36. Gives information–Other
37. Counsels/Directs behavior–Medical condition/Therapeutic regimen	–
38. Counsels/Directs behavior–Lifestyle/Psychosocial	–
39. Requests for services, credentialing	39. Request for services, credentialing
40. Unintelligible utterances	40. Unintelligible utterances

Table 2. The subjects and situations of the recorded encounters as they are described in the dentists' day notes

Case no.	Age difference, patient–dentist	Sex, patient/ dentist	Consultation purposes	Treatment procedures	Previous encounters
1	−31	F/F	Try-in visit	Two interim resin-bonded prostheses replacing two upper incisors are tried and delivered	1
2	−13	F/M	Consultation	Five teeth are extracted, and further appointments are decided for fabrication of interim removable prosthesis	–
3	0	M/M	Control visit	Registrations of oral hygiene, photographs and impressions of restored occlusion are made	20
4	23	F/M	Try-in visit	Trial placement of large fixed prosthesis of upper jaw	7
5	18	M/M	Consultation	Examination and treatment options for prosthesis are discussed	–
6	14	F/M	Consultation	Examination and treatment options for implant prostheses are discussed	–
7	21	F/F	Control visit	An interim removable prosthesis is checked	2
8	0	F/F	Emergency visit	An aching tooth is extracted	10
9	−14	M/F	Control visit	Bilateral implant-supported ears are checked for remaking	10
10	15	M/M	Consultation	Examination and treatment options for fixed prostheses are discussed	–

proven to be valid in assessing treatment outcome, compared with other quantitative methods of interaction analysis in contexts in which communication is used as an intervening variable (17). The method makes it possible to perform sequential analyses and to describe quantitatively the affective and instrumental content of verbal communication. It also makes it possible to portray different interaction behaviors during clinical encounters (5).

RIAS is derived from Bales's Interaction Process Analysis System (BIPAS), a method for assessing 'face-to-face' verbal interaction in small groups during problem-solving and decision-making, when the emphasis is on information exchange (18). BIPAS has been widely applied in different contexts. The RIAS method is a modification and development of BIPAS, originally intended to study experimentally the patient's question-asking behavior and the facilitation of such behavior in the context of medical consultations (19). Bales's and Roter's methods have similarities in taxonomies but differ in observational strategy.

RIAS was developed for the North American medical context. Before the RIAS method could be used in Swedish prosthodontics, context modifications and cultural and linguistic adjustments of the coding manual were necessary. Such adjustments should be made in practical applications, through experience of the method.

The aims of the present study were to adapt the RIAS manual for use in prosthodontics in Sweden and to evaluate the RIAS method in a pilot study.

Materials and methods

Since the RIAS method has not previously been used in dentistry, it will be summarized here.

The RIAS method and manual

RIAS is a detailed method for a deeper analysis of clinical communication. Communication is directly scrutinized for verbal events by using an audio recording made during the encounter. These events are subdivided into communication units, *utterances*, and defined in the analysis system as the smallest discriminable speech segment to which a classification may be assigned. The classification categories are arranged in the RIAS coding manual.

The RIAS coding manual was constructed by Roter and colleagues in the 1980s after a review of 61 studies on doctor–patient interactions. From these studies 247 communication variables were extracted (20). A further development resulted in the RIAS manual in 1993, containing the 40 mutually exclusive categories listed and numbered in Table 1.

The categories were divided into two clearly distinguished parts: the affective verbal part (the socioemotional exchange, according to the manual) and the instrumental verbal part (the task-focused exchange) (21, 22). The criterion for assessment was face validity, which involved checking whether the data obtained by the method are adequate to answer the problems or questions posed (23). All types of verbal behavior furthering the medical goals of the visit (and not intrinsically affective in nature) were included in the categories of the instrumental part.

The affective verbal part of the communication has no clear instrumental character. It is a function of how the content is conveyed by the voice tone and the reception of it. A basic tenet of Roter is that all communication is more or less subjective. This means that all utterances should be regarded as affective when not clearly instrumental. This includes, for example, social conversation and positive and negative talk.

All of the 40 coding categories are described in detail in the RIAS manual, including their range of content and the contextual grounds for interpretation.

The coding is intended to reflect the content and context of the dyadic exchange in medical encounters. RIAS analyses are, therefore, performed directly on audio or video recordings and are made by raters experienced in coding. The system focuses on questions and responses and on the affective character of medical consultations. At least two independent raters categorize the data. Raters first 'unitize' speech into utterances. Each utterance is then assigned to a category; an utterance cannot be assigned to more than one category. If there is doubt about the affective or instrumental content of an utterance, the affective content should be chosen. The categorization process is thus designed to capture the affective component (4, 17, 19, 24). In addition to utterance categorization, a global rating of the emotional context of the dialogue for both the physician and patient can be made for seven different affective dimensions, using a six-point scale.

Raters are trained in coding strategies over several weeks using a coding manual with detailed definitions and annotated examples. Inter-rater reliabilities have been reported to range from 0.76 to 0.96, on the basis of Pearson's correlation for the nonrare categories (21, 25–28). Random selections of recordings for double coding are usually made throughout the entire coding period, as a check against rater decay and rater drift (21, 27). Such changes within each rater can be controlled through analysis of intra-rater reliability.

The revised Swedish dental version of RIAS (RIAS-dental)

At a Swedish specialist clinic for prosthodontics, which treats only referred patients, 40 audio recordings were made of ordinary appointments known to usually contain much verbal exchange. The recordings were all made during 3 months in 1995–96. Four dentists participated, one woman and three men, aged 38–62 years. Audio recordings were made with a 'round uptake' microphone-equipped portable tape recorder that was placed as unobtrusively as possible in the treatment room before the dentist–patient meetings. All participants were informed that their visit would be recorded and were given the opportunity to decline participation. The nurse or the
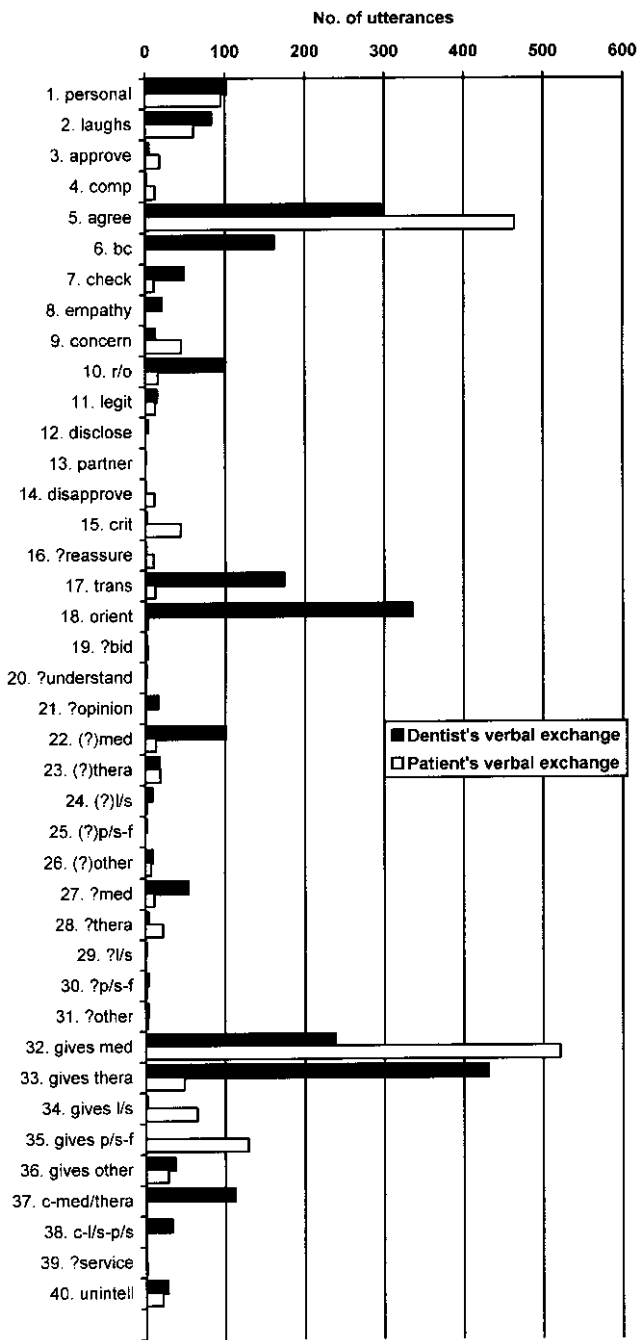
Fig. 1. Classification of all utterances in all encounters in accordance with RIAS categories of recorded exchange. The categories are abbreviated and numbered in accordance with Table 1. Open-ended questions are marked '?', and close-ended ones are marked '(?)'.

dentist started the tape recorder and left it on throughout the appointment. All recordings were listened through once by one of the authors (K. Sondell). Ten recordings were selected for further use. The selection criteria were 1) the sound reproduction had to be good, 2) either the beginning or the end of the visit had to be included, 3) more than 50% of the recording had to contain verbal exchange between patient and dentist, and 4) the patient had to have Swedish as his or her native language. When the codings were finished, 10 'case descriptions' were made from the dentists' day notes of the recorded visits. The subjects and situations of the selected cases are presented in Table 2.

A revised version of the RIAS manual, called the RIAS-dental manual, was developed. Two kinds of considerations were made, linguistic and substantial. Since the intention was to scrutinize the recordings for verbal events between dentists and patients, all communication recorded between other parties was excluded from the analyses.

Translation

When the RIAS manual was translated into Swedish, the entire text (rules of thumb, category headings, category clarifications) could be directly translated, with the exception of some of the category headings. The English headings were retained with their Swedish translation to ensure that the original meaning of the words would not be lost during the first part of the revision. Several examples of verbal events that were found under category headings such as 'Gives compliment–general' and 'Shows approval–direct', as well as transition words in American English which were heavily colored culturally, had to be excluded instead of translated. Verbal approvals, compliments, and transition words heard on the audio recordings were put in as examples instead.

Revision

Since the objective was to collect verbal events in the language of Swedish prosthodontics to exemplify the categories in the RIAS manual, direct coding by listening to the audio recordings was impossible at this stage. All 10 recordings were therefore transcribed to paper by one of the authors (K. Sondell). The transcriptions were used while simultaneously listening to the tapes during the collection of verbal events. In this manner the 'voice tone' could still be captured as intended in the application of the RIAS manual.

The content prescriptions of many of the categories were slightly modified so as to be more suitable in the context of prosthodontics. For example, 'I don't believe in those flu shots' was changed to 'I don't think it will help to take the calculus away', under the category 'Shows disapproval–direct'. Under the patient category 'Gives information–medical condition', the example 'My father lost all his teeth before he was forty' was used instead of 'My grandfather died of heart disease'. The talk concerning the dental technicians and the technical work (fixed partial dentures, artificial crowns) previously made or going to be made was placed in the categories 'Asks–', 'Gives–', and 'Counsels–medical condition, –therapeutic regimen'.

Coding method

The translated and revised manual was used to code the 10 audio-recorded encounters selected for analysis. The coding was made while simultaneously listening to the tapes and reading the transcripts. The coding procedure was performed by one author (K. Sondell), who in the spring of 1995 had attended a 3-day course in rating medical consultations by using the Roter Interaction Analysis System and the RIAS manual. The course was held by Professor Debra Roter at Johns Hopkins University, Baltimore, Md., USA.

The results were analyzed in frequency distributions and graphically. An intra-rater reliability test was made 3 months after the first coding occasion, using a proportional reduction of error measure, λ (29). The transcriptions consisted of a total of 129 text pages. Every 32nd page (a total of 4 pages) was randomly selected and coded once again while the rater simultaneously listened to the corresponding parts of the audio recordings. An assessment of the number of utterances and the categorizations was performed again and compared with the previous ratings for the same text pages. The first time the utterances in the selected pages were counted there were 122, and the second time there were 130. The intra-rater correspondence of utterance classification was 97%. Eighty-one utterances were identically categorized in both coding sessions. The intra-rater reliability coefficient for utterance categorization using lambda (λ) was 0.76, indicating that knowledge of the first classification would enable the second one to be correctly predicted with a 76% success rate (29).

Results

Generally, more utterances were categorized as task-focused exchange than as socioemotional exchange. Of the total number of utterances recorded, 37% were rated as socioemotional and 63% as task-focused exchange. Forty-one per cent were rated as patient talk and 59% as dentist talk.

The 10 audio-recorded encounters lasted from 20 min to $1\frac{1}{2}$ h and contained between 189 and 767 utterances per recording. The recorded time contained nonverbal periods during which treatment was being performed. A total of 4181 utterances were audio-recorded. Forty-eight could not be heard clearly. They were classified as 'unintell' (unintelligible). All 40 categories were used in the classification process of utterances. Some of the categories were used for classification in all recordings, such as 'Personal remarks', 'Shows agreement and understanding', 'Transition words', 'Gives orientation', 'Gives information–oral and medical condition', and 'Gives information–therapeutic regimen'. Some of the categories were seldom used, such as 'Asks for understanding', 'Partnership building', 'Asks questions (close-ended)–psychosocial feelings', 'Asks questions (open-ended)–lifestyle', and 'Re-
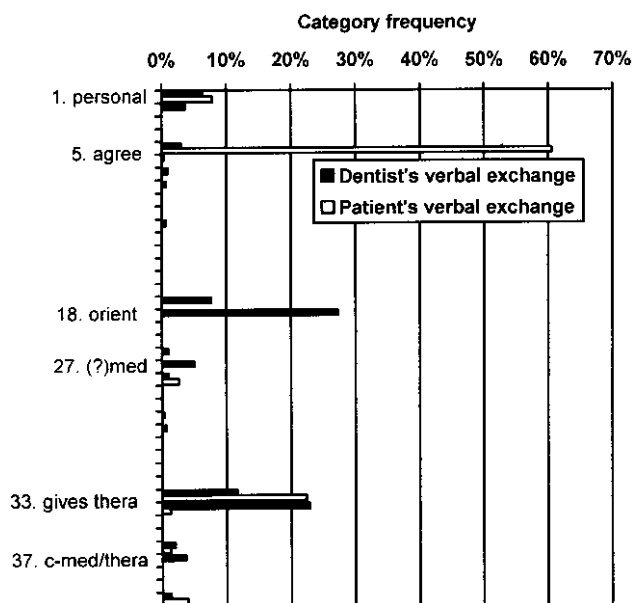

Fig. 2. Frequencies of utterance classifications in case 1. A try-in visit, at which two interim resin-bonded prostheses replacing two upper incisors are tried and delivered. The dentist and patient have met only once before.

quests for services'. The communication recorded was classified as not containing much 'question-asking' but rather more 'information-giving' and 'agreement-showing'. The classification of all the utterances into RIAS categories of recorded exchange is shown in Fig. 1.

In general, much orienting and directing verbal exchange was found on the part of the dentists. Dentists talked more than the patients in all recordings except one. Of the dentists' utterances, 65% were classified into 'task-focused' categories, compared with 53% for patients, the rest being socioemotional exchange. In all cases but one, few utterances were found that could be classified into the categories 'Counsels or directs behavior'. The classified verbal behaviors distinguished well among the encounters, which is exemplified by four selected cases, shown here in abridged figures.

Case 1 (Fig. 2) shows a picture of an active, directing, friendly, and personal dentist giving mainly directions and information. The dentist talks much more than the patient. The patient is verbally passive, agrees to things, and answers the few questions simply. The dentist's directing and transitioning verbal behaviors seem to control the proceedings of the encounter. In the day notes for this visit, it is discovered that the patient is 15 years old and has met the dentist, who is 31 years older, only once before. Much treatment is performed during the encounter, which might explain the abundance of 'direct' and 'trans' verbal behaviors, thus portraying an encounter with a verbally active dentist and a rather passive patient.

In case 3 (Fig. 3), the patient is more verbally active than in case 1. The interaction contains personal remarks and
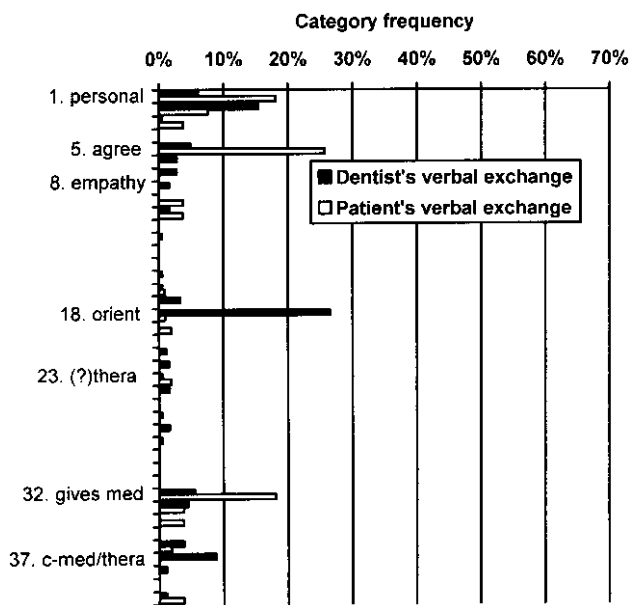
Category frequency

Fig. 3. Frequencies of utterance classifications in case 3. A control visit. Registrations of oral hygiene and photographs and reprints of newly fixed prosthesis are made. The dentist and patient have previously met 20 times.

laughing and joking on the part of both the dentist and the patient. The patient is active and agreeing, informative, and asking questions, although in a close-ended form. The dentist shows empathy and self-disclosing behavior, asks for the patient's opinion, informs and counsels, and also
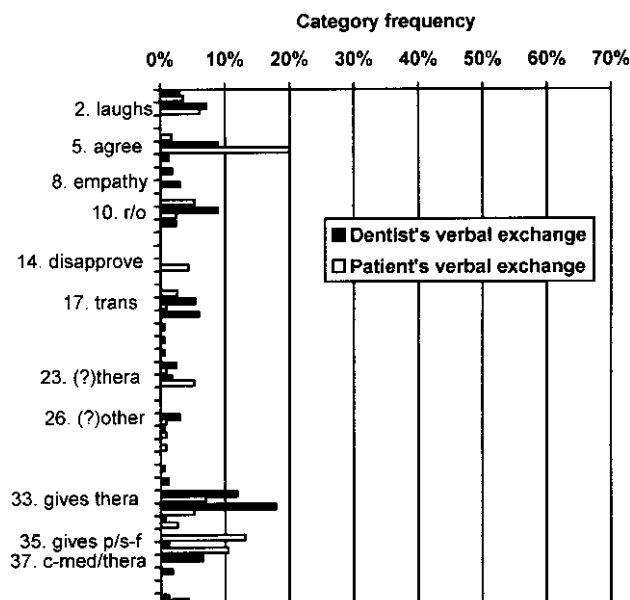
Category frequency

Fig. 4. Frequencies of utterance classifications in case 7. A control visit. An interim removable prosthesis is checked. The dentist and patient have previously met twice.

actively directs the patient through the encounter. It is noticed from the day notes that the patient and dentist have met previously several times and that they are both men and of the same age. No actual treatment is performed. This could well explain the abundance of verbal exchange characterized by 'laughs' and 'personal'.

Case 7 in Fig. 4 contains verbal exchange with much 'information giving' and 'laughs' on the part of the patient. The dentist's verbal exchange consists mainly of 'information-giving–medical condition and therapeutic regimen', 'laughs', 'counsels', and 'directing'. Both patient and dentist show a lot of 'agree' verbal exchange, thus portraying the interaction as being rather mutual.

In case 8 (Fig. 5) the patient is more active than the dentist, but some 'agree' verbal behavior still occurs. This interaction could be characterized as being mutual but still differing from the other encounters. The patient is verbally very active but in a slightly negative manner. The patient's verbal exchange consists of 'criticism', 'concern', and 'information' of mainly 'medical condition', 'lifestyle', and 'psychosocial–feelings'. The dentist's verbal exchange consists of 'orient', 'reassurance', 'agree', and 'back-channeling'. The visit was an emergency visit that resulted in the extraction of a tooth.

Discussion

The translation and modification of the RIAS manual to the context of prosthodontics was made without any major alterations. The result was a tool that could be used to quantitatively measure the communication between two interacting parties, yielding verbal exchange interaction profiles, which together formed an interaction profile of the encounter. It was clearly noted that these verbal exchange interaction profiles distinguished well among the audio-recorded encounters. The recorded patterns of communication differed clearly as to verbal behavior content and patient and dentist activity and made it possible to characterize the dentist–patient interaction.

Tone of voice, gaze, posture, hesitations, laughter, facial expressions, touch, and other nonverbal behaviors may modify the meaning of verbal utterances, since not all communication is verbal. Nonverbal communication could have an impact on patient satisfaction in the sense that if the dentist is very good at reading the patient's body language and understanding what the patient is feeling, the patient might feel less anxious and more trustful after this manner of communication (30).

However, coding by the RIAS method incorporates assessments of the tonal qualities of interaction, since coding is supposed to be made directly from audiotapes and not from transcripts only (31, 32). Voice tone and intonation of a statement should be interpreted by the coder in terms of 'how things are said'. On the basis of a general affective impression, it is also possible for coders to rate both the patient and the dentist on global affective dimensions such as anger, anxiety, dominance, friendli-
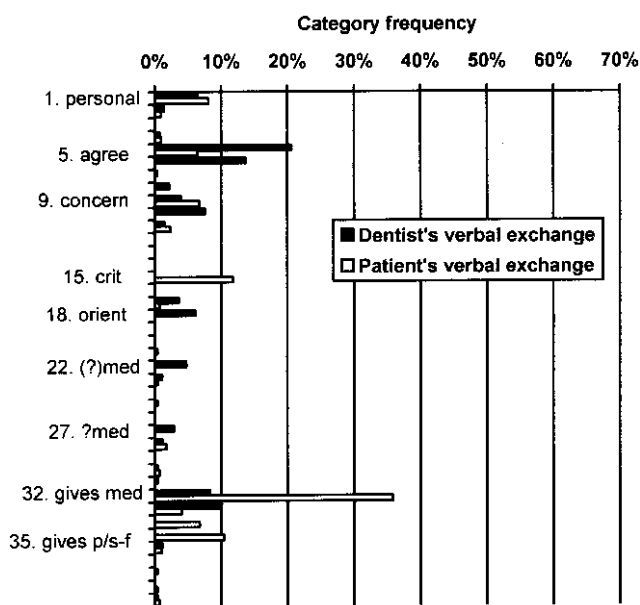
Category frequency

Fig. 5. Frequencies of utterance classifications in case 8. An emergency visit. An aching tooth is extracted. The patient and the dentist have previously met 10 times.

ness, and interest (24). This was not practiced in this study because of the few encounters recorded.

Dentist–patient communication is to a certain extent preplanned, and it proceeds in accordance with certain, more or less well-defined, customs of the context (33). It is not identical to casual, ordinary conversation, but the two have several features in common, such as questioning and informing practices, topic-shifting, turn-taking, and directing behaviors (34). These features of communication were heard in the audio recordings.

The participants were aware that their conversation was being recorded. Whether this inhibited or changed the verbal behaviors cannot be ascertained. The tape recorder or the microphone was mentioned at the beginning of two of the selected recordings. It could not, however, be heard that the audio-recording procedures otherwise influenced the communication in any further way. Both physicians and patients in medical audio-recorded settings have reported forgetting the tape recorder soon after the visit had begun, and few have indicated that the recording procedures changed their visit in any way (5, 35). Possibly, the critical issue here is the confidence existing between the researcher and the research subject. Guarantees for preservation of the anonymity of the patients and for the professional integrity of the dentists are important. In a study with 2500 audio-recorded medical encounters, so many professional shortcomings in the physician's communication with the patient were noticed that censored behavior on the part of the physicians was judged as most unlikely by the authors (36).

The speech on the recordings was segmented into

utterances or speech acts that were then categorized with the help of the revised manual. This was done without any major difficulties, although the need for transcriptions of the audio recordings made the procedure rather time-consuming.

From the beginning it was difficult to distinguish the category 'Questions' and 'Information of medical conditions' from 'Questions' and 'Information of therapeutic regimens'. The first version of these categories' explanations and examples was simply a direct translation of those of the original RIAS manual. There it was stated that all talk about drugs should be placed in the category 'Questions' and 'Information of therapeutic regimens'. In the dental context talk about drugs is often about drugs prescribed by physicians and should therefore be placed in the category 'Medical conditions'. After these modifications, the coding procedure was simplified.

There was a similar problem concerning 'Counsels or directs behavior–medical/therapeutic regimen' and 'Gives information about therapeutic regimen' and between the category 'Gives orientation, instructions' and the category 'Gives information, therapeutic regimen'. It is stated in the RIAS manual that when the information or the patient instructions contain substantially more information, the category 'Gives information, therapeutic regimen' should be used. The category 'Gives orientation, instruction' contains less information and more empty directions. Re-editing the examples and explanations also solved the classification problem for these categories.

During the categorization, it was noticed that some categories were used very often, such as the categories 'agree', 'personal', and 'laughs'. Some categories, however, were used to a very minor extent or not at all, such as 'disapprove', 'partnership-building', and 'self-disclosure'. A probable explanation would be that there seldom was talk of the latter kind. For example, self-disclosure, meant for use in analysis of the dentist's verbal exchange, is not very usual in a Swedish cultural context. The result on this point was perhaps not due to the category's lack of validity but rather to the actual frequency of such communication.

More task-focused than socioemotional exchange was classified on the audio recordings. Socioemotional exchange has an affective message, in spite of the meaning of the actual words. If there was only a slight difference or a slight double meaning between what was said and what was meant, the categorization would probably fall into the neutral task-focused exchange, because this was more apparent. For an inexperienced rater, coding by actual content is more obvious than coding by voice tone and could explain some of the differences. This might be eliminated through more extensive training. On the other hand, the audio-recorded talk between the dentist and the patient was perhaps in fact without much affect and therefore actually consisted of more task-focused exchange. As found in other communication studies, the dentists talked overall more than the patients on the recordings (24, 36, 37).

It is not surprising that the dentists talked more than

their patients. The dentists have not only the task of learning the patient's story during the encounter but also the task of moving the encounter forward towards a distinct end of the encounter with all the purposes of the encounter fulfilled. This might be done by using many transition words and giving orientations and neutral instructions like 'Open your mouth, please' and 'Please be seated'. An abundance of these verbal behaviors are also heard on the recordings. On the other hand, the communication behaviors recorded on these recordings on the part of the dentists did not show much question-asking, which certainly is a way of finding out about the patient. The dentists merely practiced information-giving and counseling, but still in a very moderate way.

The patients gave more information than was asked for. The general finding about the patients is that they were all very obliging towards the dentists, using a lot of agreement and understanding verbal behaviors. They also participated well in the personal social talk with the dentists.

Utterance definition and classification was reproducible to a rather high extent. The aim of the study was to test both the instrument and the rater. The 'training' character might explain why the intra-rater precision was not perfect. Higher intra-rater precision after a longer period of training could be expected. It has been shown in several studies using RIAS with trained raters that sufficient intra- and inter-rater reliability can be achieved and maintained during coding procedures (17, 21, 28, 32, 38).

Analyses of verbal communications in audio recordings of dental encounters have not been frequently used to understand the features of an ordinary dentist–patient relationship. Several studies have been made to understand the actions of the fearful and anxious patient during dental treatment; however, they have not told us how dentists and patients actually communicate verbally throughout ordinary dental appointments or to what extent communication behaviors have an impact on treatment outcome. This is, in fact, fairly unknown as yet. The RIAS method offers quantitative assessments of verbal communication. The present study's aim has been limited to methodologic evaluation and case studies. However, the data produced by RIAS will be most suitable for constituting explanatory analyses on a larger data base. Such a study is presently being planned, in which explanatory models will be built both to explain different communicative patterns and to relate them to outcome. From this study, it is concluded that the RIAS method in its translated and revised form is fully applicable in the analysis of communication during dental visits, providing time-tuned characterizations of the dentist–patient encounter in the prosthodontic context.

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