# Nonverbal Communication between Veterinary Students and their Teachers in Food Animal Practice

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## Abstract

Among veterinary and medical educators it has been concluded that there are many gaps in the educators' knowledge of effective clinical teaching practice and learning environments. The learning environment, important for the quality of education, contains integrating elements such as educational culture and instructional strategies, defining the behavior of the participants, the teaching behavior of teachers and the learning strategies adopted by students. Usually, the verbal dimension of communication is highlighted although it is demonstrated that in interaction situations the non-linguistic, nonverbal communication is far more effective. Nowadays, it is claimed that the students are clients in a professional relationship because in such circumstances they receive signals; a different set of expectations, responsibilities and a respect typical of their own profession. The main point explored is, the quality of nonverbal communication between veterinary medical students and their teachers, because it is believed to have an influence on learning. Ambulatory practice with food production animals was utilized, and the visual recording was included. A television program on everyday life in the University's Animal Hospital in 2009 was taken as a ready source of communication. A Small distance between the participants' bodies and faces and a minimal number of gestures and facial expressions are found. Instead, kinetic responses are well represented, either independently or as a response to the teacher's gaze. For the students the rules of behavior were dictated by their teacher. There was an obvious professional-client relationship with closeness, familiarity and respect, but also a professional-client relationship in which the students had two basic tasks; to listen and to act. These characteristics have effects on learning and consequently, new hypotheses could be established, and the observed kinetic responses should be added to checking lists with only verbally defined categories, at least when the interaction in the veterinary context is involved.

## Introduction

The learning environment, important for the quality of education, contains integrating elements such as educational culture and instructional strategies [1], defining the behavior of the participants, the teaching behavior of teachers and the learning strategies adopted by students. However, there are many gaps in the educators' knowledge of effective clinical teaching practice and learning environments [1]. In the context of food animal ambulatory practice in veterinary education the quality of behavior is carefully initialized [2]. These results showed equal and positively task-oriented interaction between students and their teachers (solidarity, tension release and agreement together on advice, opinions and suggestions relevant to the learning object). The students and the teachers also used humor as a means of relating to others in a pro-social and positive way [2], which, according to Wanzer, Frymier et al. [3] makes the content relevant, and thus, enhances learning.

The relationship between communication and learning is based on the learning paradigm emphasizing the influence of human interaction in creating and transmitting understanding. However, Vygotsky highlights the verbal dimension of communication in his sociocultural theory; language and its development, and an individual's development by this language [4], although it is demonstrated by Argyle, Alkema et al. [5] that non-linguistic communication is much more effective. Speech behavior is not only the transmission of words and sentences, but contains in its sounds and silences the real substance of socially organized interpersonal behavior [6,27]. Humor is a part of such interaction [3]. Immediate teacher, a teacher who seems relaxed, animated and vocally expressive with a lot of smile and eye contact, can enhance student learning. A teacher's nonverbal immediacy is correlated with the students' greater willingness to comply and, thus, be fundamental to management and learning [7].

Nonverbal communication is a dynamic process [8] influenced by biology and evolution as well as culture and socialization [9,10]. Nonverbal behavior – body movements, posture, gaze, phonemics and voice [11] differing in their relationship to the external referents of which they might be signs [10,14] thus being different from verbal behavior. On the other hand, dynamic nonverbal *communication* differs from nonverbal *behavior* and means body information with high communicative potential; facial expressions, vocal cues, hand gestures and posture of the body [12], which are used for the transmission of knowledge. In addition, there are also physical appearance and static nonverbal cues in interaction situations [13]. For practical purposes, nonverbal communication means two basic categories of nonverbal language: 1) nonverbal messages produced by the body and 2) nonverbal messages produced by the board setting (time, space, silence).

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Traditionally, psychoanalysts have been the specialists studying the clients' use of postures and gestures. Nowadays, in higher education policy it is usually suggested that the student should be thought of as a client [14]. The conception of students as clients focuses teaching as a hierarchical one-way or buyer-seller relationship [15], and creates undue distance between the student and the educational *process* [16]. The student as client approach easily focuses on designing instruction that is sensitive to the individual student needs, abilities and interests rather than rigidly tied to the subject matter. Professors become subservient to their customers and serious pedagogy becomes entertainment [14].

In educational contexts, an idea of learning community among peers or between the teacher and the learner is often favoured. Effectiveness of the relationship among the veterinary profession has been raised [17]. Bailey [18] could say that the students are clients in professional-client relationship (Table 1) because in such circumstances they receive signals; a different set of expectations, responsibilities and a respect typical of their own profession. This interaction has been successfully studied in different contexts, but predominantly by linguistic methods such as conversation or discourse analysis. Alternatively, in Bales' Interaction Process Analysis [19], a well-known research method for small group life observation, both verbal and nonverbal acts can be involved. This might be a more fruitful approach because there is evidence that nonverbal cues may be an important part of the verbal accounting process with or without their verbal utterances [6,20].

However, although the use of such categories and checking procedure is quick and easy, it may also be rather theoretical [13], based probably on the supposition of linguistic-like structural organization of the nonverbal action. How a speaker feels about what he says is carried by style and tone of voice [6,26]. With its pre-specified, ill-defined and discrete verbal categories, the validity of the Bales' system is also questionable [21]. However, despite the disadvantages related to a complete observing sheet provided, as well as the generalized results of this single case study in the veterinary field [2], these previous observations may be very valuable in the initial approaches to interaction phenomena in (veterinary) medicine and in an attempt to develop hypotheses to be tested. Then, the interaction itself is worth studying over the outcomes of the interacting participants [13,22-24], and the following hypothesis and research questions can be formulated:

RQ 1: What is the quality of nonverbal communication between veterinary medical students and their teachers?

RQ 1a: What are the nonverbal cues typical of this communication?

H1: There are more positive than negative nonverbal cues during communication.

H2: There are more neutral than positive nonverbal cues during communication.

RQ 1b: In students as clients context what are the nonverbal cues typical of 1) teacher and 2) students?

H3: Teacher's and students' cues are not equal as in professional-professional relationship, but there are differences between them as in professional-client relationship.

RQ 1c: What are the rules of behavior the participants follow invariably?

H4: Nonverbal behavior of the teacher (e.g. gaze) can predict kinetic responses of the students.

H5: The rules of behavior are those previously referred to if there is no variance between interaction situations.

Finally, the question RQ 2 "What would be the measurement with high quality?" is discussed.

## Materials and Methods

### Context and data source

At the University of Helsinki's Faculty of Veterinary Medicine, practical teaching sessions in the fifth year of the veterinary medical education program are an essential part of the students' professional training. This setting provided a context for the previous study [2] in which the interactive nature of learning in an ambulatory clinical setting and, in particular, the nature of the interactions between students and their teachers were explored. In this study the same ambulatory context was utilized. But, in contrast to previous Bales-based implementation, the visual recording was included. A television program on everyday life in the University's Animal Hospital in 2009 was taken as a ready source of communication and all ambulatory events (with variable duration of 1 to 5 minutes) were selected for further analysis.

### Study participants

Partly the same students as in the previous interaction study performed in the Animal Hospital Television Program. Then, fifth-year undergraduate students were involved. All of them were Finnish females aged 24 to 30. The four teachers involved were not investigated before. Because the idea was to gather the sample of nonverbal behavior repeatedly from the same person, both in similar and different situations, with the same and different interaction partners at different times, only one clinical teacher (female teacher A) mostly focused on by TV-cameras became selected as the target of observation and was taken in future analysis. Materials from other teachers (four cases) were used for training purposes when reliable observations between two observers were pursued.

### Data analyses

The television program was used to document sequences of nonverbal behavior. In this study a 39 minutes' document was cumulated. Because there are many methodological approaches to deal with when nonverbal action is in the focus of interest, methodology in this study was a compromise between them. It was based on the view that human communication is an integrated multichannel process, and the coding sheet adopted from Burgoon [25] and Guerrero [26], which contained a list of nonverbal actions easily identifiable. Thus, the four

| |
|---|
| professionalism with a role of professional and client; rights, responsibilities and expectations for both parts of interaction |
| trust, private and sensitive information and the greater degree of familiarity |
| interdependency between the professional and client in the determination of the outcome, or consequences of the relationship |
| expectations of the learning goals |
| respect |

**Table 1:** The characteristics of client metaphor [18].

| The target | | |
|---|---|---|
| Never look at the partner | 1 2 3 4 5 6 7 | always look at the partner |
| Exhibited unsteady gaze | 1 2 3 4 5 6 7 | exhibited steady gaze |
| Gave no eye contact | 1 2 3 4 5 6 7 | gave constant eye contact |
| Based on your observation of the target's face, the target | | |
| Never smiled | 1 2 3 4 5 6 7 | always smiled |
| Was facially pleasant | 1 2 3 4 5 6 7 | was facially unpleasant |
| Smiled a little | 1 2 3 4 5 6 7 | smiled a lot |
| Conveyed negative affect | 1 2 3 4 5 6 7 | conveyed positive affect |
| The target | | |
| Leaned away from the partner | 1 2 3 4 5 6 7 | leaned toward to the partner |
| Faced away from the partner | 1 2 3 4 5 6 7 | faced toward to the partner |
| sat in a side-by-side position | 1 2 3 4 5 6 7 | sat in a face-to-face position |
| Leaned back a lot | 1 2 3 4 5 6 7 | leaned forward a lot |
| The distance between bodies was: far | 1 2 3 4 5 6 7 | close |
| The distance between faces was: far | 1 2 3 4 5 6 7 | close |
| The target's voice | | |
| Was monotone | 1 2 3 4 5 6 7 | contained vocal variety |
| Sounded tense | 1 2 3 4 5 6 7 | sounded relaxed |
| Sounded cold | 1 2 3 4 5 6 7 | sounded warm |
| Sounded inexpressive | 1 2 3 4 5 6 7 | sounded animated |
| Sounded unpleasant | 1 2 3 4 5 6 7 | sounded pleasant |
| Was unfriendly | 1 2 3 4 5 6 7 | was friendly |
| Was dull | 1 2 3 4 5 6 7 | was full of life |
| The target showed: | | |
| Very little facial expression | 1 2 3 4 5 6 7 | a lot of facial expression |
| Lots of nervous movement | 1 2 3 4 5 6 7 | very little nervous movement |
| Frequent rocking or twisting | 1 2 3 4 5 6 7 | infrequent rocking or twisting |
| Little gesturing | 1 2 3 4 5 6 7 | a lot of gesturing |
| Little kinesic expression | 1 2 3 4 5 6 7 | a lot of kinesic expression |
| A lot of trunk/limb movement | 1 2 3 4 5 6 7 | very little trunk/limb movement |
| Based on his/her nonverbal behavior, the target seemed: | | |
| Anxious | 1 2 3 4 5 6 7 | Calm |
| Inattentive | 1 2 3 4 5 6 7 | attentive |
| Distracted | 1 2 3 4 5 6 7 | focused |
| Unalert | 1 2 3 4 5 6 7 | alert |
| Restless | 1 2 3 4 5 6 7 | still |
| Flustered | 1 2 3 4 5 6 7 | composed |
| Bored | 1 2 3 4 5 6 7 | interested |
| Detached | 1 2 3 4 5 6 7 | involved |
| The target's speech was: | | |
| Filled with nonfluencies | 1 2 3 4 5 6 7 | very fluent |
| Very choppy | 1 2 3 4 5 6 7 | very smooth |
| Marked by long response | 1 2 3 4 5 6 7 | marked by short response |
| Latencies | 1 2 3 4 5 6 7 | latencies |
| The conversation was characterized by: | | |
| A lot of interruptions | 1 2 3 4 5 6 7 | no interruptions |
| A lot of awkvard silence | 1 2 3 4 5 6 7 | very little awkvard silence |
| Uncoordinated turn-taking | 1 2 3 4 5 6 7 | coordinating turn-taking |
| Overall, the target's body position was: | | |
| Tense | 1 2 3 4 5 6 7 | relaxed |
| closed | 1 2 3 4 5 6 7 | open |
| rigid | 1 2 3 4 5 6 7 | loose |

The coding sheet [25,26]

**Table 2:** Time segments a) 00-1:00, b) 1:01-2:00, c) 2:01-3:00, d) 3:01-4:00.

nonverbal behavior patterns were rated: a) physical closeness with the actual distance between people, b) lean; the degree to which a person's upper trunk is tilted toward or away from the other person, c) gaze and facing and d) body orientation. In addition, the quality of the target's voice and speech were inspected (Table 2).

Positive, negative and neutral nonverbal cues were defined according to Burgoon's and Guerrero's sheet (see Table 2). Value 4 in this list meant neutral, whereas marginal values (1-3 and 5-7) referred to positive or negative cues. Usually, the values 1-3 described negative acts (never look at the partner, never smile) except under the theme of

target's face (negative, facially unpleasant on the right side of the sheet).

The behavior of teacher A and her students was followed by two academic observers from outside the faculty, concentrated on both teacher and students by turns. Timing of behavior was taken while watching and listening to each tape with variable duration from 1 minute to 5 minutes. This operation was first trained with material not involved in the final findings of this study. After each behavior sequence the discussion was launched and the final coding process was not initiated until a consensus of 100 % was achieved.

For hypothesis testing, quantitative data from coding sheets was utilized and $\chi^2$- test (H1, H2, and H3), Kendall's nonparametric correlation (H4) and analysis of variance (H5) were adopted. Quantitative methodologies were introduced over a number of positive/ negative/neutral classifications (H1, H2 and H3), characterization of nonverbal behavior themes of the coding sheet (H3 and H4) and interaction situations (H5). Observations of the students' and teacher's behavior were included in the same group (H1, H2, H5) or the behavior of the students and their teacher were calculated separately (H3, H4).

## Results

Through the interaction sequences involved, physical proximity was pronounced. The distance between the teacher's and the students' bodies and faces was either close (6) or very close (7) when they worked together. This could vary, however, from moment to moment, because of the nature of the ongoing task, and thus, [4] See above. Simultaneously, the participants leaned and faced toward their partner. It was typical of interaction that the teacher faced toward student(s) and stood in face-to-face position, but the students faced away or had only a quick glance at their teacher (Figure 1).

It was the teacher who gave constant eye contact. Despite the absence of the students' constant eye contacts they still had steady gazes at an object - rather than their teacher, in front of their faces (Figure 1). They sometimes leaned forward a lot (5,6) in order to see what was going on or, at least, showed their attention and interest (7) see above by quiet and concentrated listening. There were no interruptions in the conversations (7), but a short kinetic response by either the student or the teacher after the verbal utterance (7) with coordinating and clear turn-taking (7). Both the teacher and the students had neutral facial expressions (4) with little gesturing (1-3). However, they smiled from a little (1) to quite a lot (5) and showed relaxed body positions (5-7) see above.

The quality of the teacher's voice was neutral in its variety and it sounded calm and friendly. The quality of the students' voice was mostly limited to short and monotonic monosyllabic "okey" utterances as an immediate response to the teacher's speech sound. The students' tone never changed during the observation session, but it was sometimes compensated by moments of silence. There were physical actions, however, during these silent moments, functional trunk or limb movement with special objects. In sum, the participants made appropriate turn-takings at nonverbal level from phonetic activity to kinetic action (Figure 2).

It was statistically demonstrated that hypotheses H1 and H4 were supported. Interaction was positively rather than negatively oriented ($\chi^2 = 17,166$, p<0.001) and positively rather than neutrally oriented ($\chi^2 = 26,746$, p<0.001) and the behavior of participants was significantly correlated (r = 0,601, p<0.01). Hypothesis H2 was rejected because of wrong expectation of the number of neutral acts during interaction. Hypothesis H3 was partially accepted. On the one hand, it was not
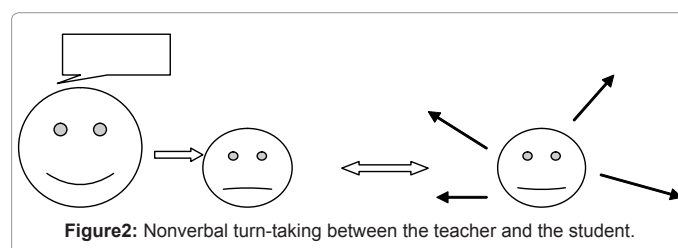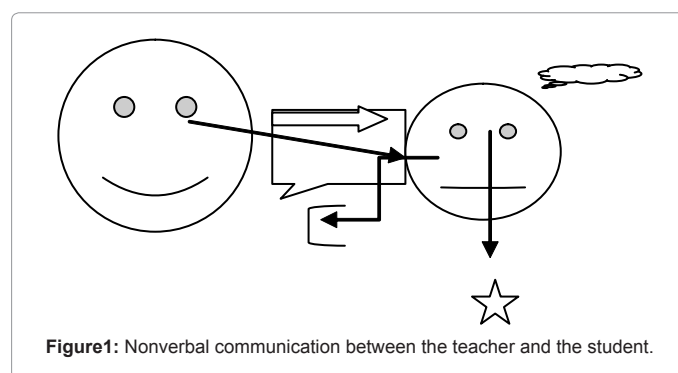
supported when the emotional tone of interaction (positive, negative, neutral) was tested, but on the other hand, it was valid when the themes of the coding sheet were included in the analysis ($\chi^2 = 189, 960$, p<0.001). (Also see Figure 1).

Interaction showed variety from moment to moment. However, using analysis of variance hypothesis H5 is supported except between situations 1 and 3 (post hoc α<0.05). Over situations it was significantly indicated that there were no differences between physical closeness, lean and body position categories and speech behavior evaluations.

## Discussion

In this study, the quality of nonverbal communication between veterinary medical students and their teachers was explored. Repetitive sequences of behavior between participants were observed and the important cues were recognized as a result of careful inspection of visual recordings. Film material was essential to achieve this kind of results. The television company has its own professional staff and the quality of recordings guarantees superior material for this study. However, this professional staff's focus of interest was mostly the animal itself, not the action of participants. Despite this, with reference to social influence processes emphasized by social learning theorists, it is probable that the presence of the television company's staff had an influence on ongoing interaction, in particular on the students' performance.

For the students the rules of behavior were dictated by their teacher. There was an obvious professional-client relationship with closeness, familiarity and respect [18, Table 1], but also a professional-client relationship in which the students had two basic tasks; to listen and to act. This finding is in line with two educational theories; a human being can learn by observing the behavior of others (Bandura's social learning), or by participating in real action (Vygotsky's Socio-Cultural Theory). The outcome was determined by dependency between the teacher's and students' acts as in Bailey's professional-client relationship. For these turn-takings from teacher to student(s), nonverbal signals were needed. The fifth year students involved in this study have already been socialized to understand the smallest possible cues in the veterinary context and the teacher has no need to change



**Figure1:** Nonverbal communication between the teacher and the student.



**Figure2:** Nonverbal turn-taking between the teacher and the student.

her neutral voice or recall her own status. She can communicate only by minimal nonverbal cues without fear of being misunderstood, which may reflect the efficiency of non-linguistic, nonverbal communication [5].

Minimal nonverbal communication is much easier in close relationships typical of ambulatory interaction situations. Nonverbal communication with physical proximity was also included in the previous study [2] based on Bales' categories. However, the communication in this analysis was classified act by act, usually verbal ones, ignoring physical appearances and nonverbal messages produced by the board setting (time, space, silence). It is still agreed with Bales that interaction is task-based and verbal (the students listen and act), but it is also facial and kinetic due to biology-based characteristics of human beings. It is also agreed with Bales that interaction is positive, with immediacy and humor. These characteristics have effects on learning [3,7] and consequently, new hypotheses could be established. Humor probably aroused students and gained their attention, resulting in a close relationship between students and teachers (h1). Similarly, causing a close relationship with more individual guidance, humor may lead to better learning outcomes (h2).

On the other hand, correlation between the students' and teacher's behavior does not mean that the students' behavior is an outcome of the teacher's action. Followed by the definition of correlation there was not a causal relationship between these two phenomena. A student is not a product of a teacher's educational intervention [14,16] but something else. What has been revealed by correlation is that acts of participants occur at the same time, appropriately and predictably (and with minimal nonverbal communication). Rather than being a product of a teacher's efforts, a student might be a product of his or her educational culture.

From the sociological perspective it is important to focus attention on the social and cultural factors that determine the complex interrelationships and interaction processes occurring between social actors [10]. In the first instance, however, the research on interaction will continue with more sophisticated methods. It is not necessarily a validity problem with Bales in a clinical and professional context, but the need for some anatomic kinesiology supplement under the task-oriented category. Evaluation of the kinetic activity of the students should be added to the list of actions observed in order to identify the basic structural properties of face-to-face interaction in an ambulatory context. Kinesiology can also be used for the evaluation of the clinical competence of the students, seen as a problematic process by many veterinary (and medical) educators. Drawings, rather than verbal signs should be favoured in the recording of movement patterns because of their iconic and continuous nature and the absence of pre-specified verbal categories.

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