Student Teachers' Awareness of Pupils' Nonverbal Responses

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ABSTRACT *The visual, nonverbal signals transmitted by pupils should provide important feedback information to the teacher and the teacher who correctly interprets this information and acts upon it should be more effective than those who do not use this information. This study with a sample of student teachers produced statistical evidence that those who are rated as of low teaching competence tend also to be those who are poor at decoding pupils' nonverbal signals. Inspection of the pupils' signals and student teachers' responses provide some suggestions as to the pupil clues to be attended to by the teacher.*

INTRODUCTION

The work reported in this paper uses the psychologist's model of 'skill' as an approach to the analysis of teaching and assumes that the skills of teaching are similar to other skills in that they involve constant monitoring of one's behaviour and modification of that behaviour, as required, so as to maximise the achievement of the goals we have set ourselves. In social skills such as those of interaction and communication as practised in the classrooms the monitoring is not only of one's own behaviour but also of that of others. It is through perception of the behaviour of others, that is the pupils, that we know to what extent we are achieving our goals. Whether our goals be in terms of pupil understanding, pupil attention, pupil co-operation, pupil order, or whatever, it is the messages oral, written, and visual, transmitted by the pupils which tell us of the effect of our behaviour.

While the use of all sources of feedback information is desirable in teaching, this paper focusses on one type only: the messages transmitted by visually received, nonverbal, messages. This narrowing of focus has three justifications.

First, commonsense suggests that pupils send messages to the teacher via their posture, their facial expression, their gestures, and their movements. These messages may be intended, may be in an agreed code, for instance hand raising to attract attention, but may also be unintended and idiosyncratic. Many, perhaps all, of these messages may be potentially useful to the teacher who is both aware of such forms of communication and also able to decode them.

Second, there is increasing evidence from social psychology that nonverbal, visual messages are an integral part of human interaction. These messages may be

transmitted, for example, by gaze, by eye-contact, by posture, by position and speed of movement, by touching, by hand signal and gesture, and serve functions both of communicating information and of facilitating interaction (cf for example, Argyle (1975), Duncan & Fiske (1977), Harper, Wiens & Matarazzo (1978)). This view from social psychology may be extrapolated to the social situation in the classroom if only to the extent of indicating possibilities for investigation.

Third, there is evidence collected in situations more closely related to teaching. Jecker *et al.* (1965) asked teachers to judge pupil comprehension on the basis of the nonverbal cues shown in film clips of pupils; they conclude that the ability is largely undeveloped in the normal classroom teacher but, following training in the recognition of cues such as body and facial orientation to the source of information, the frequency and speed of such movements, brow furrowing and raising, chin rubbing, etc., claim that significant improvement was made in the recognition and interpretation of these cues. Hall *et al.* (1977) report a series of investigations using the PONS Test (Profile of Nonverbal Sensitivity), a 45 minute film of 220, two-second audio and/or visual nonverbal stimuli, each of which has to be judged either for communicating friendliness/unfriendliness or dominance/submission. Their samples included teachers and student teachers. In comparison with other professions such as actors, students of visual arts, clinical psychologists and psychiatrists, and business executives, the teachers tended to score within the lower bands. Student teachers scored significantly better than experienced teachers and, in three independent studies, PONS scores were correlated with supervisors' ratings of student teachers' competence with results: $r=0.38$ ($p<0.03$), $r=0.43$ $p<0.02$), and 'no relationship'. Neill *et al.* (1983) in interviews with 40 female probationary teachers found that effective teachers mentioned gaze as a guide to whether the lesson was going well significantly more often than did the least effective teachers. They mentioned both their own gaze to monitor the group and the clues offered by the direction of the children's gaze. Caswell (1982) reports a small scale observational investigation in a third year secondary school class which revealed, during deviant situations, significant increases in pupil movement types such as pupil-directed gaze, head position, seat position, posture etc.; evidence that there are nonverbal behaviours which could signal potential risk to the teacher. Furthermore he suggests that some nonverbal behaviours are more indicative than others of high risk situations.

For the investigation reported here it was hypothesised that since (a) awareness of pupil ability can influence the choice of teaching strategies, and (b) awareness of pupils' attention, interest, and comprehension enables the teacher to modify teaching tactics, then awareness of the relevant nonverbal signals of the pupils should be positively related to overall classroom teaching competence.

METHOD

In the investigation fifty-seven student teachers were asked to decode pupils' nonverbal signals as shown in ten-second episodes taken from classroom videorecordings. The statistical relationships between the scores on this task and the

teaching competence grades awarded to the students on a recent teaching practice were calculated and, in addition, the students' responses explored for any guidance they might give as to the types of pupil behaviour which are of practical significance.

The videorecording from which the episodes were extracted was made during a lesson taught by the author to a class of 10 year-olds with whom a long term relationship had been established. During the lesson the teaching style was manipulated and the content chosen so that there was variation in activity and periods of contrasting liveliness and dullness. Interspersed in the lesson were intervals during which the pupils' comprehension of the material taught was assessed by written answers to objective questions. At the end of the lesson the pupils were asked to answer on their response sheets the question "Which part of the lesson did you like best?". Throughout the lesson a cameraman recorded, via a zoom lens, the behaviour of individual pupils, attempting to obey the instruction to film "in each part as many children as possible covering as many different expressions as possible. At least 15 seconds on each". (For full details see Lawes, 1985.)

Repeated viewing of the recording led to the selection of 53 episodes, each of ten seconds duration, and which involved a total of 15 pupils. Four types of item were extracted: 'Pupil Comprehension', using clips from the question-answering sections; student teachers are asked "Does the pupil answer correctly the question asked at this point in the lesson?"; the response on the pupil's sheet provides the information as to the correctness of the pupil's response; 'Pupil Attention' using clips from the deliberately active and boring parts of the lesson, and asking student teachers to identify the part of the lesson as such; 'Pupil Interest/Enjoyment': students are shown clips of the same pupil from three distinct parts of the lesson and asked to identify the part which the pupil said he or she liked best; 'Pupil Ability': the school was able to place the pupils into upper, middle, and lower thirds on recently obtained Verbal Reasoning Quotients; student teachers are shown, finally, clips of each of the pupils previously seen and asked to place each into one of these thirds. When used for testing student teachers' nonverbal interpretation the videotaped episodes are presented without sound thus ensuring that interpretations are based on visual, nonverbal messages. Each episode is 10 seconds in duration and a further ten seconds interval is allowed for the response to be marked on a sheet.

Two trials with groups of student teachers demonstrated that the tasks are seen as relevant to teaching and there are no problems in obtaining responses from the student teachers. The trials provided data on the facility and discriminating ability of each episode in the test; on this basis 27 items were retained in a final, revised version of the test. The following information refers to the final version.

Comparison of scores obtained from students preparing for junior schools and those on secondary courses showed no significant differences between means or between distributions. A comparison of scores from females and males revealed no significant difference; an interesting result when viewed against the trend of previous researches (cf. Hall, 1978, 1979) which shows superiority of females over males in nonverbal decoding. However those researches involved judgement of emotion, it could well be that the judgements in the present test involve processes

which are not governed by gender roles or upbringing but are more specific skills learnt within the classroom, i.e. not seen as sex-linked but as profession-linked.

A split-half internal consistency check, performed on scores from 57 subjects, using the odd-even technique with Spearman-Brown correction for a full-length test produced a value of +0.726. Comparison may be made with the PONS Test; Rosenthal *et al.* (1979) quote an internal consistency of +0.86 using the Kuder-Richardson formula 20. Since the odd-even technique and the application of the Spearman-Brown formula tends to be conservative compared with the Kuder-Richardson, and the PONS result is with a test of 220 items compared with the present test of 27 items, the index +0.726 seems reasonable.

The general theory behind the Eysenck dimensions of personality would suggest that those toward the extrovert end of the extrovert/introvert dimension might be more receptive to signals from others, and there is research evidence (cf. Harper, Wiens & Matarazzo, 1978) that extroversion is related to greater amount of gaze and eye contact. Scores of the videotest were therefore correlated with scores on the Eysenck Personality Inventory; the data are presented in Table I.

TABLE I. Product-moment correlation coefficients between scores on test of nonverbal decoding and scores on Eysenck Personality Inventory (** = $p<.01$; * = $p<.02$).

	Nonverbal Decoding	
	Junior	Secondary
	(N=30)	(N=27)
Neurotic/stable	−0.493**	−0.491*
Extrovert/introvert	−0.016	+0.024
Lie scale	+0.366	+0.205

The data provide no evidence to support the suggestion of a relationship between the videotest and Extroversion. However there is a significant negative relationship between the Neuroticism/Stability scale and nonverbal decoding for both junior and secondary students. The more 'stable' students tend to have higher videotest scores; perhaps the more 'neurotic' students tend to be more concerned about themselves and are thus less able to attend to signals sent by others.

The two coefficients between Lie Scale and videotest are moderate and positive; combining the two produces a figure of +0.287, which is significant at the $p<.05$ level. This raises an interesting point: how can one fake good on a task such as that in the videotest? There is no response more 'socially acceptable' than another, no way of deciding which is a 'good' answer. Examination of the 'correct response pattern' shows no regular sequence which might increase possibilities of scoring by applying a rule such as 'always mark the response in the left hand column'. Could it be that those who are good at judging pupils in the videotest are

also good at spotting the intentions of the questions in the Lie Scale of the E.P.I., i.e. they make use of all available cues?

The final version of the videotest was given to 57 student teachers constituting a year group in a college of education, apart from four students who were unable to attend the testing sessions. Of these students, 30 were junior age-range and 27 secondary, the four missing students were from the secondary group. Testing took place in three groups to accommodate to student timetables; all sessions were within the same week, and each was in a morning. Introduction to the task was from a prepared script, the same room was used each time, two 24 inch screens were used so that no student was far from a screen and there were no problems of visibility. In each group there were both junior and secondary students; it is unlikely that any difference arising in results between junior and secondary are created by differences in test administration.

The test sessions were in the second half of a summer term in which teaching practice had occupied the first half; the measure of teaching competence used was the joint judgement of the supervising teacher and the college tutor made at the end of the teaching practice as a normal routine and without knowledge of this research.

RESULTS

For the investigation of the relationship between Teaching Competence and Videotest Scores students were designated as of High, Middle, or Low, Teaching Competence, groupings which correspond with the descriptions of 'Very Good/Good', 'Satisfactory', and 'Weak/Fail' on the supervisor/tutor report form. This gave a distribution of High 19, Middle 28, Low 10.

Mann Whitney tests comparing the videotest scores of the three groups gave the results:

High TC :	Middle TC	$z=1.17$	$p<.12$
Middle TC :	Low TC	$z=2.104$	$p<.02$
High+Middle TC :	Low TC	$z=1.75$	$p<.04$

That is, while the middle and upper ranges of teaching competence are not distinguishable one from another on nonverbal decoding, the decoding scores of the lowest range of teaching competence are significantly lower than the others, a result which is in line with the hypothesis.

The use of the same Mann Whitney procedure with separate junior and secondary groups revealed a striking difference.

For juniors, the result

High TC (N=12) :	Middle TC (N=13)	$z=0$	
Middle TC (N=13) :	Low TC (N=5)	$z=1.43$	$p<.075$
High+Middle TC (N=25) :	Low TC (N=5)	$z=1.59$	$p<.056$

shows a pattern, marking off the low Teaching Competence group, which resembles that for the total sample.

For secondary the results are:

High TC (N=7) : Middle TC (N=15) $z=1.97$ $p<.02$
(High TC *lower* videoscores than Middle TC)

Middle TC (N=15) : Low TC (N=5) $z=1.53$ $p<.06$
(Low TC *lower* videoscores than Middle TC)

High TC : Middle+Low TC $z=1.83$ $p<.03$
(High TC *lower* videoscores than Middle+Low TC)

High TC : Low TC $z=0.81$ $p<.21$
(No significant difference)

Here the pattern that those of Low Teaching competence tend to score lower on the videotest than do those of Middle Teaching Competence repeats the relationship found for the junior students. But the pattern that those of High Teaching Competence score lower on the videotest than those of Middle Teaching Competence contrasts with the picture for the junior students. An explanation is offered in the Discussion section later.

The types of clue used by students in making their judgements were explored by inspection of the tapes to identify those visual clues which seem most often used when they make correct judgements and those clues which seem to lead to incorrect judgements. The basis of the suggestions which follow is the procedure described here as it was applied to the clips in the 'Comprehension' sub-test.

(a) Examination of the videotest clips to identify the visible clues present in each clip. This was done without making any reference to the records which identify a clip as one in which the pupil comprehends or does not comprehend. Each clip was viewed repeatedly and the clues emitted by the pupil noted.

(b) The clues thus identified where then cross classified on the two dimensions:

(i) clip shows comprehension—clip shows non-comprehension
(ii) clip is correctly interpreted—clip is incorrectly interpreted by subjects.

	Comprehend clues	Not Comprehend clues
Correct interpretation		
Misinterpretation	clues	clues

(c) hypotheses were formed by inspection of the data thus organised.

For the 'Comprehension' clips the following hypotheses emerged.

(1) that successful interpretation of miscomprehension is likely when there are several 'irrelevant' behaviours, for example, playing with pencil, hand to mouth, gazing around;

(2) that successful interpretation of miscomprehension is likely when irrelevant behaviour is accompanied by slow speed of response;

(3) that 'lack of irrelevant behaviour' is successfully used as a sign of comprehension, i.e. it is the use of the lack of negative signs which is the successful technique;

(4) that speed of response alone is not a useful clue although fast speed does seem to be wrongly construed as a sign of comprehension;

(5) that facial expression, such as frown or puzzled look, are not valid clues of miscomprehension although student teachers tend to use them as such;

(6) that miscomprehension is judged on the presence of certain types of behaviour but comprehension is judged on the absence of such behaviours.

Adopting the same approach for the 'Attention/Inattention' section of the test produced the following hypotheses:

(1) that 'looking at teacher' is successfully construed as a sign of attention;

(2) that 'not looking at teacher' in conjunction with irrelevant behaviour is successfully construed as a sign of inattention;

(3) that there is no noticeable difference between the facility to detect attention and the facility to detect inattention.

When the clips from that section of the test in which subjects were asked to judge "which part of the lesson the pupil found most to his liking" were subjected to a similar process no clear hypotheses resulted. However, it seems possible that if one of the three scenes shows the pupil looking towards the teacher then that scene is chosen in preference to the other two as showing the 'liked' portion of the lesson. But use of this clue is likely to lead equally to successful or unsuccessful judgement. It is possible that liking/not liking, interested/uninterested attitudes are accompanied by different patterns of behaviour in different pupils, or it may be that liking/disliking, interested/uninterested are conditions not easily detectable from visual clues.

In the final section of the test the student teachers were asked to judge pupils' relative 'Ability'. In the context of the test, they were provided with potentially more information than in previous researches which have asked for ability judgements based on still photographs. Still photographs show 'appearance', films and videotapes also show 'activity', show pupils responding and reacting in a classroom situation and, in addition, the clips used in this investigation show pupils who have already been observed in earlier parts of the test. It could be useful to know those behaviours which teachers use as clues when required to make judgements about pupils' ability level and which might be clues used unwittingly to make such judgements in the classroom. From inspection of the tapes and comparison with subjects' responses it seems,

(1) that behaviours such as 'hands to face' and 'hand play' are construed as signs of pupils in the lower two-thirds of the ability range, i.e. within the middle and lower bands defined in the test;

(2) that 'not making a response'—in these clips not obviously writing an answer—also tends to be construed as a sign of middle to low ability;

(3) that making a response, either a written response or gazing at the teacher, is construed as a sign of high or medium ability.

DISCUSSION

The investigation reported raises three questions: What is the process being studied?

How can the relationships between the process and teaching competence be explained? Are there any indications for teacher training?

In a 'natural' situation involving interaction between members of a group, effective use of nonverbal messages requires (a) awareness of the nonverbal signals and (b) the decoding of those signals. While one may assume that those making correct interpretations must be aware of the signals, one cannot assume that those who make false interpretations, or no interpretation, are not aware of the nonverbal signs. This latter group may contain those who are aware but not skilled in decoding as well as those who are not aware. The same distinction applies to the test used here. Scoring is based on correct decoding; high scorers are assumed to be aware, low scorers might either be not aware or be aware but poor at decoding. The two types of low scorer are not distinguished by the test procedure. If, however, two types of low scorer exist then these two aspects require further investigation.

To explain the finding that those who are judged to be of low teaching competence tend also to be those who score lower on the decoding test requires consideration of possible links between the two measures. That is, we must look for a link between decoding ability and teaching behaviours and another between those teaching behaviours and judged teaching competence. If the test is sampling processes which occur in the classroom, i.e. it is a valid test, then those who are not aware of visual signals or, alternatively, are ineffective in their reading of those signals, may, because of the absence of the information given by those signals, be acting on false overall impressions of the pupils in selecting strategies of teaching, and/or may be failing to pick up the feedback signals during the lesson and thus not modifying teaching tactics in response to the feedback. These ill-chosen strategies and tactics may lead to lack of success in achieving their teaching objectives. Observers of such teachers may rate them of low competence because of the obvious lack of communication and interaction, because the resulting success of the pupils is limited, because the pupils show signs of inattention and misbehaviour, or any combination of these criteria. The teaching competence ratings used in this study are based on forms of report which include as sub-headings 'planning and preparation', 'classroom performance', 'social and personal qualities', 'pupils' response, achievement, and enjoyment', 'student's evaluation of pupils' work', and 'professional qualities' and which finally require an estimate of student's overall performance.

The finding that those of high teaching competence do not differ significantly on nonverbal ability from those of middle teaching competence may be explained by reference to the idea of threshold of ability; that a certain level of nonverbal skill is required for teaching competence but that above that level further increase in nonverbal awareness does not necessarily produce significant increase in the teaching competence. This threshold may be of general awareness, that is awareness that nonverbal signals are a significant feature of interaction, or may be of awareness of the commonly occurring nonverbal signals such as those of comprehension, attention and interest included in the videotest. It may also be that general awareness plus the experience of decoding common clues equips the teacher for future decoding of more individualistic clues.

These explanations could hold for the results obtained with the junior students

and for the distinction between low and middle teaching competence secondary students. There remains the question of the low decoding scores of the high teaching competence group of secondary students. Here is a group of students rated as 'Good' teachers who nevertheless do no better than the 'Weak' teachers on nonverbal decoding. Can it be that success in secondary school teaching comes about through processes which do not include the nonverbal? Is success, as currently judged, reliant on good verbal exposition? Does the necessary feedback from pupils come via the verbal channel? Are the criteria used by supervisors based on the verbal skills of teacher and pupils? Or could it be that the type of nonverbal signals used in the test, clips of individuals showing clues of comprehension, interest, attention, etc., are not the nonverbal clues of practical significance in secondary classrooms? Are there more macro clues from the class as a unit? Would the nonverbal clues of potential disruption prove of more significance? There is much for speculation and investigation.

The present investigation was with one group of students in one college of education. While the conclusions need to be verified with other samples they are sufficient to warrant consideration of the need to include nonverbal decoding in the range of skills to which students are introduced in teacher training courses. A prerequisite would be the awareness that nonverbal messages are a part of human interaction. It may be sufficient for some students that this be brought to their attention by lecture and discussion, for many it may be more effective if it is demonstrated as being so. There are films which give vivid examples; perhaps videotapes of the students themselves and presented with tutors' analysis could be even more striking. This knowledge of the importance of nonverbal signals may in itself lead to greater awareness; it may in addition require training in scanning and observation to maximise the likelihood that nonverbal signals are being attended to. The videotest technique is unnatural in that verbal signals are absent and subjects are thus directed to the nonverbal signals; in the classroom the teacher has to select the nonverbal signals for attention.

Training in the skills of decoding might be based on videotapes such as those used in the test in which pupils' reactions are recorded in objectively determined situations. The training could follow a sequence such as:

the student tries his skill at decoding the nonverbal pupil messages;
these responses are compared with the 'correct', objectively determined, responses;
discussion of the use of appropriate clues, possibly with tutor; but perhaps with other students so that those who have succeeded can share their judgements;
a second attempt by the first student using a second set of videoclips.

The analysis of the videotest presented above revealed that there are some clues which are commonly misconstrued; a striking example is in the attribution of 'ability'. Training procedures should include demonstration of this as well as of positive clues.

A special case for training arises from the finding that, for the secondary group, those judged to be of high teaching competence tended to be low scorers on the test of nonverbal awareness of pupils. The explanation proffered is that at the secondary

stage verbal interaction rather than nonverbal is emphasised both in judgement of competence and in the actual performance. To accept an explanation of the situation as at present encountered does not mean that one must accept the existing criteria as being sufficient. It can be argued that by re-directing teachers' awareness so that it encompasses not only the verbal but the nonverbal feedback from pupils might, by increasing the interactive nature of the teaching, result in a change in teaching style, a change in pupil learning style, a change to a situation of exchange and negotiation rather than of communication and reception; all of which might bring about classroom success which has to be judged on criteria beyond those at present used.

Throughout this discussion there has been an implicit assumption that nonverbal decoding skills are amenable to training procedures. Yet the data quoted on the relationship between nonverbal decoding skills and personality dimensions might be interpreted as showing that subjects with certain personality traits, i.e. who tend toward neuroticism or who are less open to a range of information, are less able to attend to, or to decode, nonverbal signals. If this relationship with personality traits is substantiated then the question of selection for training in addition to techniques of training needs to be considered.

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