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ABSTRACT
        A study was conducted to analyze the role that
nonverbal communication plays in classroom climate. A 40-item
classroom communication climate questionnaire was developed, and
administered to 76 students and 8 teachers to determine its
reliability and validity. After several changes and deletions, the
final version of the questionnaire was administered to 200 students
and 7 teachers from classes in speech and hearing sciences, biology,
speech, and journalism. Although analysis of the data seems to
emphasize openness on the teacher's part and the ability of the
teacher to teach dramatically as factors affecting classroom
communication, the validity of some of the measures used must be
questioned. Therefore, further research in this area is necessary.
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CLASSROOM COMMUNICATION CLIMATE: THE DEVELOPMENT AND TESTING

OF A MEASURE OF THE NONVERBAL COMMUNICATION IN THE CLASSROOM

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NONVERBAL FACIAL SENSITIVITY IN THE CLASSROOM:

TOWARD OPTIMUM CLASSROOM COMMUNICATION CLIMATE

Abstract

Nonverbal communication has recently seen an increase in both popular and scholarly interest. Particularly, nonverbal communication between teachers and students has received much attention. While numerous educational scholars have focused on the socioemotional climate of the classroom, this study proposes to analyze the part nonverbal communication plans in classroom climate. Subjects consisted of seven instructors and 200 students in four different departments at a large southern university.

A questionnaire was developed to measure Classroom Communication Climate. It was then administered to divergent classes of students to assess the reliability and validity of the construct, and compare its various factors with students' nonverbal facial sensitivity, as measured by Leathers and Emigh's FMST instrument.

Results of factor analysis indicate that while some valid communication factors emerge from the questionnaire, evidence indicates that other factors, as measured by earlier researchers, need further testing.

The relationships of the various factors of nonverbal classroom communication were discussed. Contributions, limitations, and future directions of this research were discussed.

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CLASSROOM COMMUNICATION CLIMATE: THE DEVELOPMENT AND TESTING

OF A MEASURE OF THE NONVERBAL COMMUNICATION IN THE CLASSROOM

INTRODUCTION

That the communication of the teacher in the classroom is an integral part of the educational system, is not a recent revelation. At least as early as the mid-1960's (Amidon and Flanders, 1963), there has been concern in the scholarly community over communication within the classroom and its impact on learning. More recently, there has been more vocal concern among educators, parents, and politicians over the seeming inadequacy of public school to educate young people (Daly and Korinek, 1980; A Nation at Risk, 1984). Recently, communication scholars have seen an increasing amount of research directed at various facets of classroom communication (Daly and Korinek, 1980). One such area which several researchers have obviously looked on as of considerable importance is the part communication plays in establishing a classroom atmosphere conducive to learning. While education scholars have, for some time, studied classroom climate, the purpose of this study is to review selected communication studies which are concerned with the impact of communication factors on the climate inside the classroom. Through this review, an assessment will be made of the adequacy of the classroom communication climate construct, with the goal of further study.

LITERATURE REVIEW

McMahon (1976) investigates impression formation and nonverbal communication as a function of attribution leading to impression formation. From this study, McMahon concludes that "(1) attitudinal judgements, in reference to 'message' as well as 'person', were largely based upon nonverbal

cues, and (2) nonverbal cues serve primarily in the formation of interpersonal impressions and evaluations" (p. 294). She calls for more study into the process of attributional impression formation. Leathers (1979) investigates the types of feedback messages sent through verbal, as opposed to, nonverbal channels. He found four factors to comprise the range of nonverbal feedback cues "responsiveness, emotionalism, deliberativeness, and assurance" (p. 341). Two important conclusions are drawn: "(1) Future research should attempt to determine how information provided in feedback responses is actually used, and (2) such research would necessarily entail a shift from the feedback response to the full feedback sequence as the unit of analysis" (p. 353). Nussbaum (1981) investigates instructor communication style as a possible cause of perceived teaching effectiveness. While this research revealed no causal relationship, results suggest the existence of indirect causal links. For instance, "the extent that an instructor is dramatic and relaxed within the classroom will positively affect the overall perception of that teacher's style of communication, and there is a positive relationship between a good communicator style and perceived teaching effectiveness" (p. 744). The author suggests that research intended to improve teaching should focus on the teacher's classroom communication.

Norton (1978) lays the foundation for the communicator style construct, defined as "the way one verbally or paraverbally interacts to signal how literal meaning should be taken, interpreted, filtered, or understood" (p. 99). Communicator style is operationalized in terms of ten sub-constructs--"dominant, dramatic, contentious, animated, impression leaving, relaxed, attentive, open, friendly, and communicator image" (p. 99). In constructing a self-report instrument, the Communicator Style Measure with 102 items (CSM-102), Norton presents evidence of its reliability and validity.

Leathers and Emigh (1980) construct a new _Facial Meanin_, Sensitivity Test (FMST), test its accuracy and validity, and demonstrate its practical use. Besides the obvious use of the FMST to assess the decoding skills of an individual, Leathers and Emigh suggest the following as a potential use: (compare the abilities of individuals and groups to encode and decode facial meanings".

Woolfolk and Woolfolk (1974a) investigate the "effects of teacher verbal and nonverbal behaviors on student perceptions and attitudes" (p. 297). By manipulating the degree of positiveness in both verbal and nonverbal feedback of the teacher, the authors claimed support for their general hypothesis that the more positive the teacher feedback to the students, the more positive the students perception of, and attraction to that teacher. Norton and Nussbaum (1980) "examine whether certain dramatic behaviors are systematically associated with effective teachers" (p. 567). Two instruments were used to assess student perceptions of (1) dramatic behaviors exhibited by the teacher, and (2) teacher effectiveness. Overall the effective teacher is significantly more dramatic than the ineffective teacher" (p. 571). Nussbaum and Scott (1980) "investigate student/teacher solidarity as a factor mediating the relationship between an instructor's communicative behavior and student learning" (p. 553). Solidarity is defined as "the degree of psychological closeness people perceive between themselves" (p. 554). Another construct, communicator style, from Norton (1978), is assessed for its impact on student learning. Nussbaum and Scott conclude that "moderate to moderately high levels of solidarity" (p. 558) may be the optimum as regards student attitudes and achievement. Accordingly, "the teacher who attempts to become too psychologically close with students or who fails to nuture at least some perception of psychological closeness with students will have less than a

desirable effect on overall classroom learning" (p. 558). Scott and
Nussbaum (1981) investigate the influence of student perceptions of
communicator style, self-disclosure, and solidarity of student perceptions of
teacher effectiveness. All three independent variables are reported
significantly related to perceived teacher effectiveness. Generally, the
authors conclude that since the communicative behaviors studied were found
to influence instructor evaluations as well as classroom learning, these
behaviors--style, self-disclosure, and solidarity, should be emphasized in
teacher training programs. Andersen, Norton, and Nussbaum (1981) report
on three investigations into the relationships between student
perceptions of affective, behavioral, and cognitive learning. The
constructs of teacher immediacy, solidarity and communicator style
comprised the teacher communication behaviors. Overall the studies
support the contention that "perceptions of teacher communication
behaviors make a difference in student perceptions of effective teaching
and in student affect toward the instructor and the course" (p. 390).
Andriate (1982) investigates "teacher communication behaviors that affect
student perceptions of the teacher-student relationship in the learning
environment" (p. 792). Results agree with Nussbaum and Scott's (1980)
finding of a curvilinear relationship between level of solidarity and
student learning. An additional result of moderately high solidarity is
found to be anxiety reduction. Specifically, "professional dress standards,
moderate self-disclosure, spontaneous smiling, sweeping eye contact,
positive feedback to student responses, and relaxed bodily postures may
optimize student learning" (p. 807). Rosenfeld (1983) investigates student
perceptions of supportive and defensive communication climates in the
classroom and their use of copying mechanisms in those having defensive
climates. Two main conclusions emerge: (1) teachers should concentrate on

emphasizing supportive behaviors, and not concern themselves over
defensive ones, and (2) coping mechanisms can be a valuable teaching
tool for managing classroom communication. Finally, Nussbaum (1983)
reports evidence that a systematic program aimed at changing teacher
behaviors can have a significant effect on students' evaluations of
the teachers and also student achievement. A teacher training program
utilizing videotapes of teachers' classroom performance, individual
counseling by a supervisor, and student ratings, was shown to have a
positive effect on both student perceptions of teacher effectiveness
and student achievement scores. A curious result of this study was
evidence of a "negative link between teaching experience and teacher
effectiveness" (p. 681).

Wheeless (1976) operationalizes self-disclosure and interpersonal
solidarity and investigates their interrelationships. The results of
parallel studies indicate that self-disclosure and solidarity are
positively related, the solidarity measure validly distinguishes between
closer and more distant relationships, and higher levels of self-disclosure
are associated with high solidarity relations than were associated with
low solidarity relations. In addition, Wheeless developed a technique
for improving the reliability of the self-disclosure scales.

Wheeless (1978) refines a measure of perceived interpersonal
solidarity, and uses it in studying the broad construct of trust in
relationships. Using self-reports of trustworthiness of the individual,
self-disclosure of the individual, trustworthiness of people in general,
and disclosiveness in general, Wheeless finds evidence that "trust and
disclosure can be considered to be criterial attributes of solidarity"
(p. 151). The author's conceptualizations of solidarity and self-disclosure
are supported by the data. Kearney, Plax, and Wendt-Wasco (1985) examine

the potential for student affective learning of immediacy salience and teacher nonverbal immediacy. Teacher immediacy and affective learning were found to be positively related in both people and task-oriented classes. As for the salience of teacher immediacy, a significant relationship was found in people-oriented classes, while not found in task-oriented classes.

Gibb (1961), based on eight years of work, developed a 12-category system of behaviors characteristic of supportive and defensive climates, with six categories for each. Defensive climate categories include "evaluation, control strategy, neutrality, superiority, and certainty" (p. 143). The supportive climate categories include "description, problem orientation, spontaneity, empathy, equality, and provisionalism" (p. 143). Since the essay's purpose was simply to propose the above categories, no experiment was reported. Hays (1970) conducted a study which developed test items operationalizing Gibbs' categories, and factor analyzed the results. Four statements conceptualizing each category were constructed as part of a Likert-type instrument which the students were asked to mark as describing their teacher well or poorly. Gibbs' original categories did not emerge clearly from the factor analysis. There was overlap between the predicted defensive and supportive climates, as well as among the categories within each climate.

SUMMARY

The first purpose of the preceding review and discussion is to examine important studies in nonverbal communication and more specifically nonverbal communication within the classroom. From this discussion several implications may be drawn, especially as to the type of research needed in nonverbal instructional communication.

Several authors (Leathers, 1979; Nussbaum, 1981; Scott & Nussbaum, 1981; Andriate, 1982: Nussbaum, 1983) call f(further study of classroom communication. Both Leathers (1979) and , :rton and Nussbaum (1980) call for research focused, not simply on the teacher or the student as the unit of analysis, but the entire gestalt of classroom communication as the more appropriate focus. Leathers (1979) suggests study of the entire "feedback sequence," referring to the three-part sequence of: (1) sender sends message, (2) receiver sends feedback, and (3) original sender reactu to receiver's feedback. In studying this classroom climate, Andriate (1982) and Rosenfeld (1983) research different aspects of classroom communication without a clear conceptualization of the overall construct or the sub-constructs which combine to form this communication climate. Wheeless, in two separate studies (1976, 1978) develops, validates and utilizes a measure of interpersonal solidarity to examine the relationships between trust, self-disclosure, and solidarity between teacher and pupil. As with most of the other studies all subjects were drawn from communication classes. Kerney et al., while focusing on immediacy, use divergent classes-- accounting and speech--and find that students have different expectations regarding teacher behavior in different types of classes. Students generally view immediate behaviors as more important in people-oriented classes such as speech.

CRITIQUE AND RESEARCH QUESTION

From the previous review several implications may be drawn for research needed in this selected area. The first is that in analyzing classroom communication, subjects should not consist exclusively of students in speech classes. The previous review has evidenced the problems of gen.ralizing outside this population, especially when focusing on the communication climate

therein. Next, the construct of classroom communication climate has not been adequately conceptualized.

Accordingly, the following research question will guide this research: Can a valid measure of classroom communication climate be developed based on earlier instructional communication research?

METHOD

Following is a brief explanation of the methodology for this study. The three sections will be Overview, Pilot Study, and Main Study. Each section will contain the following sub-sections: Questionnaire Construction/ Revision, Subjects, Procedures, and Results, with a discussion to follow each section.

Overview

This study attempts to develop a theoretically-based, valid measure of the communication climate within the classroom. Initially a pilot study was run, aimed at adequately conceptualizing classroom communication climate. Through a pilot questionnaire, subjects will gauge the importance to classroom climate of a number of communication concepts which studies have found to be related to the quality of the communication atmosphere within the classroom. From the resulting data, a second version of the Classroom Communication Climate (CCC) questionnaire will be developed. This time, the items will be worded so that subjects will be rating their own class sections on the various sub-constructs of CCC identified in the pilot. Factor analysis will be the primary method of data analysis, in order to validate the instruments in both parts of the study.

Pilot Study

Questionnaire Construction

A forty-item Likert type questionnaire, based on selected research,

was developed and administered, along with one open-ended question allowing subjects the opportunity to comment on anything they perceive as important to CCC and not covered in the questionnaire. The forty Likert items were developed primarily from items used by Norton (1978, 1983) to measure communicator style, and Andriate (1982) to measure solidarity. From Norton's style measures were derived four-item sub-scales measuring students' and teacher's openness, attentiveness, and dramatic-ness. In addition to these and the solidarity sub-scale, four representative items were taken from the Purdue Cafeteria Teaching Evaluation instrument, to gauge the perceived importance of teaching effectiveness on CCC. Finally, using content validity as a guide, two sub-scales were constructed, measuring the nonverbal sensititivity of students in one and teacher in the other.

Subjects

Students (N=76) from four classes and eight teachers volunteered to participate in this study. The student sample was comprised of students in two class sections of speech, one section of journalism, and one of education. Two of the teacher subjects were the teachers for two of the subject classes. The other six teachers' classes were not involved in the study, but they volunteered to complete the questionnaire themselves as part of the study. The students were fairly evenly balanced on race and gender. The teachers were a cross-section of assistant professors, and associate professors, male and female.

Procedures

In each class section, the instructors allowed approximately 30 minutes at the end of the period for volunteers to complete the questionnaire. Subjects received an oral explanation of the project, as well as written instructions on completing the questionnaire, since a conceptual understanding

of the CCC instrument was essential for the purpose of the pilot study.
Students were encouraged to include any comments on the open-ended question
at the end of the survey.

Results

For the pilot data, factor analyses were run to check the validity
of the questionnaire items. Preliminary factor analysis on all forty
items suggested several changes for further analysis. The teacher effectiveness
items were shown to be conceptually problematic and were excluded from further
analysis here. In addition, the teacher-focused items, the student-focused
items, and the solidarity items were separated in order to factor analyze each
set of items separately, with the assumption that they are conceptually
distinct. Factor analysis in these three sets of items proved more fruitful
than that done on all forty items together. The teacher items yielded six
factors; the student items yielded five; and two of the four solidarity
items loaded cleanly onto one factor. The other two solidarity items were
split-loaded on two factors. For the student and teacher items, the
resulting factors do not clearly reflect the concepts which these scales
of items were used to measure in prior research. For example, the first
three teacher attentiveness items loaded with one of the nonverbal
sensitivity items, while the fourth attentiveness item was split-loaded on
different factors. For the teacher items, three factors emerge from
analysis: attentiveness, non-verbal sensitivity, and affective expressiveness.
The other factors remain conceptually unclear. Openness and attentiveness
are the only clearly defineable factors resulting from the student-focused
items.

Discussion

The seeming ambiguity among the items representing related communication
concepts was not unexpected. From the literature review, there seemed to be

substantial overlap among many of the communication variables investigated.
This pilot study was an attempt, first, to measure the perceived importance
of variables found to be important to the communication atmosphere in the
classroom, and second, to validate the instrument used in the study. From
the results, it was apparent that many revisions, some deletions, and
possibly some substitution of items were needed before the follow-up
questionnaire would be ready to be administered. Since the follow-up
would measure the quality of perceived CCC, instead of the perceived
importance of the variables as in the pilot study, some of the conceptual
problems might be better accounted for in the final data. Results of this
research also suggest that another look needs to be taken at specific
teacher communication behaviors which may be predictive of students'
perceptions of teaching effectiveness.

Main Study

Questionnaire Revision

Based on the results of the factor analysis of the pilot data, several
changes and deletions were made in constructing the final version of the
CCC questionnaire. It was determined that sub-scales would be constructed
for the sub-constructs of attentiveness-containing four items, openness-
containing four items, and dramatic-containing three items. Since the
purpose of this study is to measure the quality of CCC as represented by
openness, attentiveness, and dramatic-ness of the students and teacher in
each class, each questionnaire needed to include items measuring the
subject's perception of, for example, the _attentiveness_ of both the students
and the teacher in their particular class. This was done by including two
sets of eleven parallel items--i.e. Students in this class are good listeners./
The instructor is a good listener. This was done to facilitate comparison
of the perceptions of students with those of their teacher on each of the
items and sub-constructs.

In addition, another important change was needed for the study. Since, in the teacher-focused section of the questionnaire, each instructor would actually be rating their own behavior, some re-wording needed to be done to indicate the change in focus of the questionnaires administered to the teachers. An example would be changing the item "The instructor seems sensitive to others' feelings", which appeared in the student questionnaire to read "I try to be sensitive to my students' feelings", as it appears in the teacher questionnaire.

One other change was made between the pilot questionnaire and the final form of the CCC. The response options in the pilot ranged from NI (not important) to VI (very important), since the instrument was designed to measure the subjects' perceptions of the importance of, say, attentiveness, openness, etc. But, for the final version of the CCC, subjects were actually being asked their perceptions of the presence of each sub-construct. Accordingly, the response options were changed to range from SD (strongly disagree) to SA (strongly agree).

Subjects

Students (N=200) and teachers (N=7) from eight classes volunteered for the study. Two of the sections were taught by the same instructor. Of the eight classes, three were sections of Speech and Hearing Sciences, two of biology, two of speech, and one of journalism. The seven instructors ranged from assistant professors through full professors, including both male and female professors.

Procedures

All student subjects completed the questionnaire entitled "Student Perceptions of Classroom Communication Climate" at the end of a regular class period. Along with written instructions, an oral explanation was provided by the researcher to emphasize that the CCC instrument was a

measure of their perceptions of the communication cli.. · .n the class

in which they were at that time. The instructors, after ιs · ·nr the

same orientation, either onted to fill out the questionnaire in cιaε · ..·

at their leisure.

Data Analysis

Data was analyzed at the p>.05 level of confidence using the SPSS-X

statistical program. Specifically, the data was coded, factor analyzed,

and factor scores computed for each subject for each factor emerging

from the factor analysis. Also, the alpha reliability coefficient was

computed for each factor.

Results

Questionnaire items pertaining to student behaviors were separated

from those directed toward teacher behaviors before employing factor

analysis. Using a varimax rotation, this analysis yielded three student

factors and two teacher factors. Again, as in the pilot study, the factors

which emerged were not as easily explained as earlier research might have

indicated. The first student factor, with alpha reliability of .72998, seems

a combination of openness and dramatic-ness on the part of the students.

Both the remaining factors have problematically low alpha coefficients,

.49816 and .48405 respectively. The first of the two has three student

attentiveness items loading on it, while the other seems related to

affective sensitivity. The picture presented by factor analyzing the

teacher items is much the clearer. The first factor (coefficient alpha=

.80882) is clearly a combination of the teacher being an open communicator

and also an attentive receiver. The second (coefficient alpha=.77046) is a

function of the teacher's being dramatic in the classroom. Table 1 contains

the factor matrix for the student factors, while Table 2 contains that of

the teacher factors.

DISCUSSION

The most important conclusion to be drawn from this study is that the validity of some of tne measures used in instructional communication research is called into question. As illustrated by Tables 1 and 2, the factors which emerge here are not arranged neatly along the expected lines as suggested by earlier studies. Another important aspect of this study is the focus on both students' and teacher's communicative behaviors within the classroom context, as a barometer of the climate therein. This, theoretically, should yield a more accurate and more valid indicator of classroom communication climate.

The data point clearly to two factors concerning teacher communicative behavior. The first factor seems to point to the importance of openness on the teacher's part, as both sender and receiver, in the classroom. The second teacher behavior factor points to the importance of their being dramatic as another contributor to classroom climate. These areas of teacher classroom communication behavior seem fruitful not only when studying classroom climate, but also as a possible factor in how the student rates the class and teacher in course evaluations. The student-directed factors are somewhat more problematic. Only the first factor reaches an acceptable level of reliability using the alpha coefficient statistic. This factor combines student dramatic behavior with communicative openness. Neither of the other two factors achieve an acceptable alpha. This is not easily explained. The items themselves which load on these two factors are items previously used by other researchers, but because of the low reliability no other conclusions should be drawn from them. However, the constructs suggested by these factors, student attentiveness and affective sensitivity, might be worthy of further

attention. If more reliable indices of these factors may be developed, the
analysis of student communication factors within the context of classroom
communication climate may be more meaningfully studied.

Since this study calls into question the validity of many
questionnaire items commonly accepted as content valid, more study seems
in order on student perceptions of the communication in the classroom.
One obvious area of interest would be the impact of the factors identified
in this study on the evaluations students make of their courses and
instructors, data which is used as primary evaluation data in many colleges
and universities.

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TABLE 1

Rotated Factor Matrix: Student Items

Item Code	Openness/Dramatic	Attentiveness	Affective Sensitivity
SDR3	.72710	.05731	.08169
SOP3	.69963	.33641	.06949
SOP4	.67610	.05976	.16728
SDR1	.63559	-.07622	.22533
SOP1	.60670	.37455	.02775
SAT1	.19764	.72557	-.17084
SAT3	.07084	.69421	.18162
SAT4	.03665	.58116	.31031
SDR2	.10642	-.03489	.83133
SAT2	.25365	.33421	.60937
SOP2	.38530	.17396	.38778

TABLE 2

Rotated Factor Matrix: Teacher Items

Item Code	Openness/Attentiveness	Dramatic
TAT1	.84939	.02489
TAT2	.78181	.20132
TAT3	.73587	.17206
TOP1	.60537	.47677
TAT4	.51371	.14768
TOP2	.50692	.46843
TOP3	.24669	.76650
TDR3	.17925	.71845
TDR1	.36860	.70469
TDR2	.36739	.62547
TOP4	-.08483	.60448

NOTE: Item Code indicates the individual item number and the sub-scale to which it originally belonged. For example: SOP1 is the first student openness item, and TAT2 is the second teacher attentiveness item.