AN ANALYSIS OF TEACHER-INTERNS' VERBAL AND NONVERBAL CLASSROOM BEHAVIORS

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ABSTRACT

AN ANALYSIS OF TEACHER-INTERNS' VERBAL AND NONVERBAL CLASSROOM BEHAVIORS

By

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The objectives of this research were threefold: (1) to construct an operationally explicit and replicable instrument to measure multiple categories of verbal and nonverbal teacher-learner classroom behaviors; (2) to experimentally assess the effects of variable and fixed interval schedules of videotaped classroom observations on categorized verbal and nonverbal teacher-intern behaviors; (3) to determine the extent of statistical interrelationships among the multiple categories of verbal and nonverbal teacher-intern and learner behaviors. Emphasis was accorded to examining responses by teacher-interns as they spontaneously manifested themselves within the context of interactional exchanges with learners.

The foci of this research emanated from the finding that effects of scheduled classroom observations on verbal and nonverbal behaviors have received little or no experimental attention, despite implications for influencing behavioral

productions by those observed in the natural environment. In addition, it was found that many of the measurement schemes used in educational research to categorize teacher-learner behaviors are operationally ambiguous and unreplicable. Finally, it was noted that consideration of spontaneously occurring interactional behaviors by teachers and learners, with particular emphasis on nonverbal responses, has been accorded little attention.

A series of videotaped observations of Teacher Corps teacher-interns were conducted in the classrooms of six public elementary schools, grades K-6. A five minute segment of videotaped observations were analyzed by four trained judges who used a Behavior Rating Schedule developed for this study, to categorize verbal and nonverbal behaviors. These ratings yielded the data for analyses.

The results indicated that the Behavior Rating Schedule was operationally workable. With respect to the experimental component of the study, in which observations were conducted on variable and fixed interval schedules, it was found that no statistically significant treatment effects were manifested in the behaviors of teacher-interns. Scheduled observations were not differentially related to categorized verbal and nonverbal responses. Data from the descriptive component of the study indicated that teacher-interns' approval tends to be passively, nonverbally expressed whereas disapproval tends to be explicitly, verbally

communicated. Smiling, verbally probing teacher-interns are associated with thoughtful and responsive pupils over a variety of verbal performance measures. In addition, task-relevant pupil performance tends to be highly interrelated and unidimensional. It is concluded that nonverbal behaviors, especially in form of approving facial expressiveness, may be important in defining a supportively task-oriented, positive social-emotional climate. Nonverbal responses by teacher-interns may be more notable correlates of learner performances than are many verbal behaviors, and appear to have important implications for classroom management.

Approved: Louis S Tonat
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CHAPTER I

INTRODUCTION

Review of the Literature

Interpersonal Communication

Verbal behavior has long been a principal subject of experimental scrutiny over the years, and until recently, to the relative exclusion of systematic attention directed to the study of nonverbal interactional behaviors. It has been amply demonstrated that a wide range of verbal stimuli can influence a variety of behaviors of participants in social encounters. Both verbal and nonverbal responses have been shown to be systematically acquired, maintained, and eliminated, as a function of the contingent manipulation of a host of verbal stimuli (for extensive reviews of the literature, see Krasner, 1958; Salzinger, 1959; Williams, 1964).

A body of research is accumulating, however, leading communication analysts to agree that nonverbal behavior is a significant medium of communication, and in fact largely represents the medium by which emotional and motivational states are expressed (Argyle, 1969; Birdwhistell, 1961; Ekman, 1965; Ekman and Friesen, 1967). Interactants in social

encounters are continually transmitting and concomitantly monitoring nonverbal signals communicating about the immediate social situation. These signals, as with verbal cues, have been posited and established to provide information affecting mutual attentiveness and responsiveness, channel control (speech and listening periods), interpersonal attitudes, and emotional reactions (Argyle, 1969; Ekman, 1965; Ekman and Friesen, 1967; Kendon, 1967).

Argyle (1969) has extensively reviewed recent experimental studies investigating the relative efficacy of nonverbal cues (e.g., facial expression, head orientation, and tones of voice), on subject's reactions. He found that nonverbal cues clearly had greater impact on subjects reactions than the actual words used to convey emotions. Similarly, Argyle reports that such nonverbal operants as smiling, postural and proximal orientation, eye contact, and facial expressiveness have been shown to function as more effective social reinforcers than such simple verbal reinforcers as "good" or "right" used by themselves. Nonverbal, non-content characteristics of speech including pitch, rate, density, length, pauses, and silences represent channels of communication which have also been found to act as determinants of the social interactive process (Matarazzo, Wiens, and Saslow, 1965). As Krasner and Ullmann (1965) have observed, it is often not what an individual says but the way he says it that influences how his peers react to him.

Interpersonal relations is negotiated by what Argyle (1969) calls the "silent language," or the nonverbal code which is always present but often implicit and ambiguous in social episodes. It is so integrally a part of the social context that both its processes, characteristics, and its operant effects, are frequently overlooked. This, despite the rich, varied, and complex meanings with which nonverbal language is weighted. In reference to this other half of the communications signal, and pointing up its significance to the teacher-learner setting, Galloway (1966) has observed that nonverbal communications are constantly being monitored by pupils, the meaning of verbalizations being emphasized or even contradicted by the constellation of operant expressions and conduct exhibited by a teacher irrespective of the teacher's design or wishes. The nonverbal dimension Galloway asserts, "has been minimized, underplayed, and sometimes overlooked in teacher-pupil research," (p. 57).

An attempt to remediate the neglect of research on teachers nonverbal responses has been made by Galloway (1962), who demonstrated that teachers who tended to be encouraging in their communicative contacts with pupils exhibit their interest in pupils through nonverbal listening behaviors, congruent responsiveness, and emotional support. Teachers who exhibited inhibiting communicative behaviors showed (1) disinterest in pupil talk, (2) were inconsistent in their behavioral responses to pupils, and (3) tended to express

disapproval in their nonverbal contacts with students. Research by Bernstein (1961) also suggests that nonverbal communication by teachers may be more significant to pupils than teacher verbalizations. Bernstein found that "disadvantaged" youngsters from "lower classes" depend almost exclusively upon nonverbal messages for the detection of meaning in classroom situations.

From these observations the implication is clear that pupils who have not achieved the skills necessary to comprehend (decode) the verbal language and signals of teachers are at a disadvantage in competing in the academically oriented classroom. The learner who seemingly "fails" to comprehend teacher's complex verbal communications (or cues conveyed in any of a variety of channels) may merely reflect the fact that he has not acquired those skills necessary to decode or interpret the novel behavioral messages. It follows that in programming a learning enviornment, teachers who erroneously assume that pupils possess the normatively standard repertoire of "average" pupil compentencies in a given social context, may be programming their learners for academic failure. Academic performance, this suggests, may largely be a function of the acquisition of specific compentencies either more or less appropriate to a given, contextually specific situation in which the compentency is to be learned and exhibited. The special language and signals (i.e., linguistic codes and nonverbal cues) emitted by teachers and present in the

learning milieu, can either increase or decrease the probabilities that the critical responses to be acquired by learners shall be achieved. Any wide disparity in culturally and experientially derived patterns of verbal and nonverbal conduct and stimulus cues between partners in the learning situation must be recognized and appropriate strategies designed and implemented in order that critical performance behaviors may be achieved and manifested by those who are present to learn, interactants in a situation which is predicated upon effective, efficient, and mutually interpretable communications.

Aside from the above general comments about the importance of nonverbal behaviors in the context of the teacher-learner setting, there are a number of studies exploring more specific aspects of nonverbal communication in interpersonal episodes which shall be considered, followed by a brief overview of research studying the role of verbal behavior in social interaction. This material shall be described generally within the context of a reinforcement paradigm. The following information should indicate the range of variables extant in, and their implications for, categories of both verbal and nonverbal communications in interpersonal contacts.

Nonverbal Behavior in Social Interaction

Gaze Direction.--Attentional behaviors, reflected in large part by eye contact, is an important factor in the initiation and maintenance of social encounters. It is significantly influenced by the social reinforcing stimuli manifest in the situation, and itself represents a medium by which social reinforcement can be conveyed. A number of studies point up the influence that "looking" can have in interpersonal communications, and the effects of various reinforcing variables as they interact with eye contact.

Exline and Messick (1967) report that dependent subjects who were given low verbal reinforcement for looking, looked more at the interviewer. Consistent with this observation, Efran (1968) demonstrated that subjects looked more at a confederate who was positively reinforcing, in the form of smiling and nodding, especially if the confederate was perceived to be of higher social status. These results support Efran and Broughton's (1966) earlier finding that subjects maintain more eye contact with individuals toward who they have developed higher expectations for reinforcements in the form of social approval. Similarly, Exline and Winters (1965) found that subjects increase frequency of eye contacts with an interviewer perceived as evaluating them positively, and reduce eye contacts with a negatively evaluating interviewer.

A study by Ellsworth and Carlsmith (1968) indicates that in a situation in which positive verbal content is communicated, frequent eye contact produces more positive evaluations in the dyadic interaction; conversely, with negatively verbal content frequent eye contact produces negative evaluation. The researchers caution against assuming that lack of eye contact is a necessary indicant of a negative or disinterested reaction on the part of a participant in a social encounter. It is suggested that in some verbal communications (in which the speaker emits negative remarks about himself), an interactant may avoid frequent eye contact (which may be perceived as threatening) and yet prove to be an ideal companion, signifying his attention merely by remaining discretely silent. Examples of such a situation noted by the authors, include religious confessions and psychiatric sessions.

The foregoing hypothesis is consistent with Kendon's (1967) suggestion that the degree of emotionality in social interaction can be regulated through the amount of mutual gaze the interactants allow each other. Kendon posits that gaze direction has monitoring, regulatory, and expressive functions in verbal exchange situations. He bases this conclusion on an extensive review of studies of visual interaction in natural settings. Monitoring is posited to provide feedback on an interactant's attentiveness and reaction, and information on conclusions of thought units. Regulatory and

expressive (signalling) functions are said to control the level of involvement or arousal allowed by participants in the social episode.

Argyle and Dean (1965) found that gaze direction also varies as a function of distance between interactants. Visual interaction was found to decrease as communicants move closer together in physical proximity. It has also been widely found that both males and females exhibit more eye contact when listening than when speaking (Argyle and Dean, 1965; Duncan, 1969; Exline, Gray and Schuette, 1965; Exline and Winters, 1965), and that in social encounters having an aversive quality, both male and female subjects tend to look less at the experimenter, though females look more in general (Exline, Gray, and Schuette, 1965). Furthermore, females tend to increase eye contact in positively valenced interactions, while males decrease visual contact (Exline and Winters, 1965).

Clearly, visual interaction in social episodes has important implications as it affects the initiation, maintenance, and termination of the encounter. It is a medium by which interactants may both transmit and receive discriminable cues which provide feedback on the process of the interaction, and the attitudenal orientation of the participants. It appears also to regulate the degree of emotionality permissable in the encounter.

Facial Expression.--In concomitance with speech, facial expression is the major channel of nonverbal communication. In social interaction facial expressions provide feedback cues revealing an interactants emotional state, and the degree to which he comprehends and agrees with the verbal message (Argyle, 1969). Osgood (1966) identified three dimensions of facial expressions by factor analysis, inferring "Pleasantness," Activation," and "Control." He suggests that 7-10 basic regions can be discriminated by cluster analysis, these possibly corresponding, as Argyle (1969) suggests, to such inferred emotions as happiness, surprise, sadness, fear, anger, contempt, and interest. Rosenfeld's (1966) work indicates that attitudes can be conveyed by facial expression. He found that subjects instructed to win approval emitted more smiles, as well as exhibited more positive head nods and gesticulations. Rosenfeld (1967) subsequently found that the facial component has a stronger effect than the vocal component (both being independently significant), in his study of positive, neutral, and negative attitudes inferred from two-channel facial-vocal attitude communications. Clearly, affective information is conveyed in social interactions by facial expression; however, as Argyle and Kendon (1967) observe, some expressions (e.g., smiles) may be employed as part of a highly ritualized culture-based code used by interactants to control aspects of the interaction process, and hence may not necessarily represent an operant expression of

a particular emotion. The authors note that an entire body of research awaits investigation, the functions of facial expressions and other nonverbal communications within an interaction sequence having yet to be fully explored.

Proximity.--Physical distance between interactants has been correlated with attentional or "attending" responses, and approach-avoidance behaviors. Mehrabian (1968) found that subjects stand closer to someone they like, and Little (1965) reports that closer spatial proximity between communicator and addressee is associated with more positive attitudes. Congruently, Campbell, Kruskal, and Wallace (1966) have shown that subjects move closer to members of preferred racial groups. Willis (1966) recorded initial speaking distance between standing interactants. He found significant variations in distance as a function of the relationship between participants in the social episode, their sex, age, and race. Porter, Argyle, and Salter (1969, in Argyle, 1969) are reported to have found that females stand closer than males to same-sexed targets, and that individuals are highly consistent in the proximity they adopt in different situations. Proximity varies, however, with the social setting (Sommer, 1967), and has been shown to differ for persons from different cultures (Watson and Graves, 1966). Argyle and Dean (1965) postulate that proximity is a function of the equilibrium of approach-avoidance forces. It is suggested that degree of attitude or liking-disliking between

interactants is reflected in the proximal relationship which they assume vis-a-vis each other, mutual liking being reflected in stronger approach forces and hence, closer proximity. The researchers also propose that closer distances and increased eye contacts with the other indicate higher degrees of intimacy, a postulate confirmed by their finding that subjects within close proximity (i.e., two feet apart) exhibited much less visual interaction than they did when there was greater distance between them. Confirmation is also provided by Porter et al. (1969, in Argyle, 1969) who reportedly found that subjects more closely approach someone whose eyes are closed, the effect being greater for males approaching females.

Posture.--Postural orientation may be categorized into several dimensions including standing, sitting, lying down, forward-back lean of trunk etc., and has been correlated with liking-disliking (Mehrabian, 1968), and emotional congruency or non-congruency (Scheflen, 1965), and perceived status in relation to others (Goffman, 1961). Mehrabian (1968) found that subjects exhibited different postures to those they liked or disliked; forward lean of trunk (concomitant with closer proximity) toward one's addressee communicated a more positive attitude to the addressee than did a backward lean of posture and a greater distance. Posture was also found to be associated with high-low status relationships, subjects being more posturally relaxed with a low

status person, facing him less directly, and having a less open arm or leg position. Consistent with these findings, Goffman (1961) has observed that high status persons (e.g., psychiatrists) adopt a much more relaxed posture (putting their feet on the table) than that exhibited by lower status individuals. Scheflen (1964; 1965) has shown how participants in a social encounter may vary their sitting or standing positions to be congruent or non-congruent with others present, a finding consistent with that reported by Charney (1966) who studied congruency and non-congruency of postures of client and therapist during a single psychotherapy hour. Charney found a progressive increment in congruent postures during the hour, with the content of verbal material during the congruent periods differing from that during the non-congruent periods. In this vein, Argyle (1969) reports that posture can also reflect an individual's emotional state. Reliable agreements among judges as to which emotion a given posture expresses, have been obtained. It may also be noted that various categories of social responses have been shown to be reinforced (increased in rate of occurrence) by an interactant's forward lean toward the speaker (Argyle, 1969; Krasner, 1958; Williams, 1964).

Head Movement.--Head-nodding and head-shaking can play important roles in verbal interaction. A head-nod may serve as a talker's cue for feedback from a listener, or function as a signal to an addressee that he has permission to speak;

when emitted by an addressee it may signal that he wishes to speak (Dittmann and Llewellyn, 1968). Head-nods can also act as a reinforcing stimulus of a behavior which it follows in the course of interaction (Argyle, 1969; Krasner, 1958; Williams, 1964). Mattarazo et al., (1965) reports that interviewer head-nodding led to an increment in the duration of interviewee speech. Rosenfeld (1966) has shown that subjects motivated to seek approval, positively nod while approval-avoiders exhibit more head-shaking in free social interaction; the positive responses, he reports, are associated with approving reactions from the peers to whom they were directed. Positing that the maintenance of free social interaction may, in part, be a function of the normative reciprocation of common approval-related responses, Rosenfeld (1967) demonstrated that subjects emit more smiles and positive head nods in response to approving interviewers than to disapproving or non-responsive interviewers. These results are interpreted to support Rosenfeld's hypothesis of a reinforcement-feedback system which may significantly determine the social interaction process.

Gesticulation.--Gestural activity, here defined as any observable movement of arm, hand, or finger not in contact with another part of the body, has been related to affiliative responses (Rosenfeld, 1966; 1967), and emotional states exhibited in psychotherapy sessions (Ekman and Friesen, 1967; Wachtel, 1967). Argyle (1969) reviews the limited experimental

literature on the topic, and reports that gestural movements primarily convey emotion, playing a central part in social interaction. He notes that hand movements are especially associated with agitation (e.g., clasping them tightly together and hand-face contact). Krout (1954, in Argyle, 1969) elicited hand movements by asking subjects personal questions designed to arouse different emotional and motivational states; subjects were asked to delay their reply until signalled, the signal being given when a gesture manifested. Some statistical regularities were found among the thousands of gestures produced and recorded from 100 subjects, the data suggesting that fear was associated with hand-to-nose contact; shame, with finger at lips; aggression, with fist gestures; and frustration, with open hand dangling between legs. Ekman and Friesen (1967) report that among disturbed patients, there is a great deal of hand-face contact, and suggest that some gestural behaviors may have meaning in terms of attacking the self, reassurance, and exhaustion.

Body Contact.--Despite the paucity of research on physical contact in social encounters, some studies have indicated that there may be important differences within and between cultures, in the form and extent of normatively permissable bodily contact, and that tactile communication may represent a limited language of affectivity (Argyle, 1969; Duncan, 1969).

Jourard (1966, in Duncan, 1969) found that there were significant sex differences in accessibility to touch by all target persons in his study; females being considerably more accessible to touch than males. Tactile interaction with opposite-sexed friends was also notably greater than with any of the other target persons. Argyle (1969) observes that physical contact is the most basic form of social behavior; early interpersonal relation between infant and other people consisting almost entirely of patterns of physical contact. Later, however, these patterns of body contact become largely transformed into a relationship which is mediated almost exclusively by visual cues of facial and gestural expression, and the auditory cues of speech. Certainly, tactile interaction as with other dimensions of nonverbal communication, has yet to be systematically investigated and functionally systemized into a comprehensive theoretical framework describing the stimulus-response characteristics of verbal and nonverbal behaviors in interpersonal relations.

To summarize the research findings cited on the effects and implications of nonverbal behavior in social interaction, the following points seem salient:

1. Gaze direction affects the degree of emotionality permitted in an interaction, and is related to the perceived social status of the participants and their expectations of positive/negative reinforcements;

2. Facial expressiveness conveys cues indicating the emotional and attitudinal states of interactants;

3. Proximity relates to, and can convey, attitudinal states of interactants, distance between communicators reflecting level of permissable intimacy, and liking/disliking;

4. Posture reflects emotionality and attitudinal states in an interaction, and is related to the perceived social status of the participants, and the degree of liking/disliking between them;

5. Head movements can convey degree of approval/disapproval between communicators, functioning as positive/negative reinforcers of behavior which it follows in interactions;

6. Gestures relate to the emotional state of participants in an interaction, and have also been associated with affiliative approach behaviors by interactants;

7. Body contact, the most basic form of social interaction, relates to the degree of emotionality by participants in an interaction;

8. Nonverbal behaviors have been shown to be both discriminately perceiveable and interpretable as cues which influence the actions and reactions of participants in social exchanges, and may be conceptualized as discrete channels of communication which may supplement each other by reinforcing or even contradicting a predominant verbal or nonverbal mode of presentation in social encounters.

Verbal Behavior in Social Interaction

Language.--There has been little systematic investigation of the functioning of language in social interaction. Argyle and Kendon (1967) report on the findings of some exploratory studies which might be mentioned. They cite a study by Joos that indicates that for different types of encounters, a different linguistic style is adopted--"Intimate," "Casual-Personal," "Social-Consultative," "Formal," and "Frozen" styles. Moscovici and Plon (1966, in Argyle, 1969) are reported to have shown experimentally how the physical arrangement of interactants may affect the style of language that is used in the behavior space. They found that pairs of subjects seated face-to-face, but screened, exhibited linguistic styles in which they spoke more, used more verbs, and more redundancy, and were less abstract in conversation than the more formal linguistic style shown by subjects seated side-by-side and back-to-back.

Speech and Movement Coordination.--Investigations of patterns of hesitation and of disturbances in the production and sequences of words has suggested that such variation in speech performance may be associated with variations in the speaker's emotional state, there being evidence strongly indicating that more hesitation pauses and a faster rate of speech are exhibited when subjects are anxious (Mahl, 1956). Condon and Ogston (1967) have examined the interrelations of

the movements of listeners and speakers. The researchers describe the phenomenon of "interactional synchrony" in which it is found that the flow of movement configurations in the listener (at motoric, phonic, syllabic, and word levels) may be rhythemically coordinated with the patterns of speech in the speaker. Kendon's (1970) findings support those of Condon and Ogston, and also show how the manner in which individuals may be in synchrony with one another can vary, and that these variations are related to their respective roles in the interaction.

Modifications of Verbal Behavior.--In their review of the experimental literature on verbal behavior, Kanfer and Phillips (1970) report that modifications of verbal content, duration, and speaker order have been clearly demonstrated to occur as a function of the contingent use of subtle verbal reinforcers. It might be mentioned that in line with an operant paradigm, Heller and Marlatt (in Franks, 1969) view such verbal reinforcers as discriminative stimuli which provide information as to the appropriate or desired response class for the subject; thus setting the occasion for, and increasing the probability that, the critical response shall be emitted.

Two classic studies of verbal learning were done by Greenspoon (1955) and by Taffel (1955). Greenspoon demonstrated that classes of subjects' verbal behaviors could be modified as a function of the contingent use of subtle verbal

reinforcers (mmm-humm) by the experimenter. Similarly, Taffel showed that the contingent use of a positive verbal stimulus ("good") resulted in increased emission of the reinforced verbal response class. Hildum and Brown (1956) early demonstrated that verbal reinforcers utilized in a particular way, is effective both for increasing the frequency of opinion statements as well as for shaping opinions. Among more recent work in the area, Kanfer and McBrearty (1962) used minimal cues such as physical attitude and nondirective verbal responses to reinforce selected topics in a structured interview, finding that such reinforcement resulted in an increment of time spent on such topics. Haas (1962) studied conditioning of affective responses, finding that both positive and negative sentence endings were increased by the verbal reinforcement of their occurrence. A number of studies (e.g., Adams and Frye, 1964; Noblin, Timmons, and Reynard, 1963; Timmons, Noblin, Adams, and Butler, 1965) have shown within the framework of psychotherapy, that interviewer comments, such as verbal interpretations, confrontations, or reflections, can be used successfully as contingent reinforcing stimuli, producing predictable changes in the patient's productions. In the context of the psychotherapeutic interview situation, Kanfer and Phillips (1970) observe that whether intentional or not, the therapist may consistently communicate verbal cues for particular behaviors with the result that modifications may be observed in the responses of the attending

subject. The authors conclude that there may be few areas of verbal content that cannot be manipulated in the interview situation by systematic utilization of subtle reinforcing cues (e.g., head nods, smiles, verbal sighs of approval) from the interviewer. Truax (1966) has shown, in studies of the behavior of patients in psychotherapy, that even when the therapist is not deliberately attempting to modify the patient's verbal output by contingent reinforcement, his general attitude toward the patient's behaviors and his style of interviewing can achieve the same results as the systematic reinforcement approach.

These findings particularly point to the special significance that verbal cues and the contingent use of verbal (and nonverbal) reinforcing stimuli may have on interactants in the teacher-learner setting. Whether the emission of these cues, or contingent delivery of reinforcers by teachers is unintentional and unsystematic, or deliberately programmed in the learning milieu, it is clearly possible that many verbal and motor behaviors by pupils may be manipulated and controlled.

Verbal Reinforcement in the Classroom.--The procedures operative and effective in the modification of behavior in the social milieu are hypothetically the same as those executed by experimenters manipulating verbal and motor behaviors in more controlled laboratory and field settings (Argyle, 1969; Hall, Lund, and Jackson, 1968; Truax, 1966; Williams,

1964). Studies employing an operant conditioning paradigm have clearly shown that rewards and punishment can be conveyed by teachers' utterances. Verbal agreement, encouragement, support, and praise, as well as negative cues by teachers, have been demonstrated to significantly affect future behaviors by the recipient pupil, insofar as he will produce more or less of whatever was reinforced (Ayllon and Haughton, 1964; Hall, Lund, and Jackson, 1968; Hall, Panyan, Rabon, and Broden, 1968). A number of studies (Hall, Lund, and Jackson, 1968; Madsen, Becker, and Thomas, 1968; Thomas, Becker, and Armstrong, 1968) have established that the contingent use by the teacher of reinforcing verbal stimuli result in improvements in pupils' study behavior, attentiveness, and non-disruptive operants emitted in the classroom. There is a continuous flow of both verbal and nonverbal cues being emitted in the teacher-learner setting, making up the interpersonal communications which serve to modify and control responses by interactants.

Variables Affecting Reinforcement.--There are a number of variables which have implications for the effects of conditioning and reinforcement systems employed in a behavior space. Kanfer and Phillips (1970) note that some of these factors include (1) the type of reinforcing stimulus used, (2) characteristics of the critical response class, (3) the relationship between the subject and the behavior modifier, and (4) the extent to which the subject may be aware of the

response-reinforcement contingency. Gerwirtz and Baer (1958) studied the effects of a social reinforcer on learning in children under conditions of social deprivation and satiation. They found that children who had been experimentally deprived of social contact responded at a higher rate to the social reinforcer than did children who had been experimentally satiated with such contact. The response learned was not a verbal one, but the study, as Williams (1964) notes, is pertinent in that it indicates that a verbal reinforcer is responsive to deprivation and satiation of the social drives of the subject. This finding has implications for understanding learners' classroom performance and social behaviors in interpersonal situations.

The emotional climate has implications for affecting reinforcement and verbal learning, which may be especially relevant to the classroom environment. Williams (1964) reports on a study by Weiss and Ullmann (1960) investigating the effects of emotional atmosphere and withholding of reinforcement in an interpersonal situation. It was found that a hostile atmosphere (induced by the experimenter's interacting in a hostile manner with subjects) and non-reinforcement, both resulted in decreased responsiveness in using emotionally primed words as compared with those subjects who experienced a friendly interactive episode with the experimenter following conditioning. In the same context, Argyle (1969) informs that when verbal and nonverbal cues conflict for being hostile

or friendly, the total signal can be disturbing and confusing to the auditor. An interactant in a behavior setting may be exposed to a hostile or friendly atmosphere, or as often happens in the classroom, may be reinforced individually and exclusively in the presence of other interactants. Will an increment in the frequency of response occur in a subject who is present in a situation in which another subject is being verbally reinforced? Williams (1964) reports that two studies investigating the phenomenon show contradictory results. A study by Spreen (1961) found that non-reinforced subjects did not increase their use of the verbally reinforced response class, while a study by Fadigan (1961) showed that subjects did increase their use of the reinforced response.

While the majority of studies report successful conditioning of many types of response classes, some researchers report negative results using similar classes of responses and reinforcing stimuli. These latter findings led to an issue being raised about which there is still great controversy, the issue being that of awareness as a precondition to changes in performance in verbal learning tasks. Spielberger and DeNike (1966) found that unaware subjects did not differ from controls in rate of emission of plural nouns, suggesting that awareness may be a necessary condition for learning. Dulaney (1961, in Williams, 1964) provides evidence that the acquisition of a verbal response occurs through the mediation of verbal hypotheses, implying that awareness on some level is

always a factor where the conditioning effect is observed. Williams (1964) and Bandura (1969) review a number of studies investigating the role of awareness in learning, reporting that some researchers conclude that learning without awareness does occur, while others argue that awareness is prerequisite to changes in conditioning. It has been posited that failure to detect awareness in subjects may be due to insensitive and inadequate post-experimental measuring instruments of the phenomenon. Kanfer and Phillips (1970) note that numerous studies have demonstrated that those subjects who can describe various elements of the task on a post-experimental questionnaire show better learning of the task, though it is not clear whether improvement in performance follows or precedes awareness. The authors conclude that the hypothesis that awareness is a prerequisite for learning is not clearly supported by empirical evidence. The conflicting findings continue to be unresolved about how awareness may be adequately assessed, and the role of awareness as either a mediating or a correlated process.

To summarize the literature relevant to verbal behavior in social interaction, the following points seem salient:

1. Emotional states of interactants may be conveyed by characteristics of speech which include rate of utterance and verbal disfluencies;

2. Verbal and nonverbal movement configurations by interactants may vary or coordinate with an addressor's patterns of speech;

3. The content and duration of speech can be modified as a function of a variety of verbal and nonverbal reinforcers, whether contingently or non-contingently delivered;

4. Teacher's contingently delivered verbal "rewards" and "punishers" can modify a wide range of pupils' verbal and nonverbal classroom behaviors;

5. The effectiveness of verbal reinforcers may be mediated by the individual's history of reinforcement, the extent to which the individual is aware of the response-reinforcement contingency, and the emotional climate of the behavior space.

Schedules of Observation

Behaviors can be observed on different schedules just as reinforcers can be delivered on a number of varying schedules. Ferster and Skinner (1957) have most extensively studied the effects of schedules of reinforcement, their book on the subject presenting data comprising a quarter of a billion responses for 70,000 hours of recorded behaviors. Their research demonstrates that a Variable Interval schedule produces sustained responding at a low rate of occurrence, with no delay after delivery of reinforcement. The stability of the rates of responding is in part dependent on the intervals composing the schedules, and the fact that responding at a constant rate (resulting in reinforcement) itself becomes

reinforcing (Reynolds, 1968). A Fixed Interval schedule is delineated by low overall response rate due to a pause following reinforcement, the length of pause increasing with the length of the interval, with a gradual increment to high terminal response rate as the interval ends. The development of the Fixed Interval performance is basically a discrimination process (observing the consistent absence of reinforcement during the early part of the Fixed Interval), and hence, the overall rate toward the end of each interval increases over what it was during the Variable Interval. The organism, as Reynolds (1968) observes, is controlled by its temporal discrimination. Studies have shown that the form and rate of a wide variety of operant verbal and non-verbal behaviors, emitted by psychotic and non-psychotic populations alike, have been varied in predictable and controlled fashion as a function of the schedules (specifying the contingencies) of reinforcement (Bandura, 1969; Reynolds, 1968).

Whether schedules of *observation* may be associated as discriminative stimuli* with the delivery or contingencies

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*A discriminative stimulus refers to a class of stimuli which precede and accompany operants but do not elicit them as eliciting stimuli elicit respondents (i.e., non-instrumental, reflexive responses). The presence of a given discriminative stimulus increases the probability of those operants which have been reinforced in the presence of the same discriminative stimulus. When responses composing an operant have been frequently reinforced in the presence of the particular stimulus, that stimulus (discriminative stimulus) achieves control over the operant to the extent that the frequency of those responses is high in the presence of the stimulus and lower in its absence (Reynolds, 1968).

of critical reinforcers in the teacher-learner setting, is problematic. This issue, to the best of the present author's knowledge, has not been considered experimentally, though its implications as a possible discriminative stimulus are clearly important. Assuming that schedules of observation may function in the teacher-learner setting as a discriminative stimulus, it is significant in its potential effects on the behaviors of classroom interactants to the extent that responses under the control of a discriminative stimulus are more frequent in the presence of that stimulus, and hence, the frequency of the critical response may be controlled by controlling the stimulus (e.g., by manipulating the observation schedule, the form and frequency of pupils' non-disruptive, task-attending behaviors may be affected, and the frequency of teachers' positive non-verbal and verbal responses, etc.). The schedule, being temporally associated with critical reinforcers, becomes a discriminative stimulus, setting the occasion for the response to occur in the observation space. A schedule, as a possible discriminative stimulus, is not itself a reinforcing event, but rather, is a cue indicating the prevailing reinforcement contingencies, and is a necessary condition under which a given reinforcer can occur.

The present research design includes an experimental manipulation to assess the effects of two different interval schedules of classroom observation as they may differentially affect teacher-interns' behaviors.

Behavioral Analysis in the Field Setting: The Use of Videotape

Videotape provides an exact audio-visual reproduction of recorded events. This medium affords a means for observing and analyzing a wide variety and a large number of behaviors pertinent to the teaching situation. Moreover, these recorded observations can be easily conducted in the natural setting afforded in the classroom.

A number of recent studies have established the usefulness of videotape in educational research. Carus (1970) conducted extensive videotaped observations of student teachers' performance in the classroom. The results were evaluated by the teachers in a training program designed to improve their teaching effectiveness. Carus demonstrated that videotape can be effectively used in describing, interpreting, and assessing the quality of teaching performance. The researcher also found that students and student teachers directed little attention to the videotaping process. Stoller and Lesser (1963) found that recorded television allowed teacher-trainees to more critically evaluate an observed classroom lesson than did "live" T.V. observations, which in turn were found to be superior to direct in-person observations. In another study Stoller and Freedman (1964) confirmed their view that students could more critically evaluate an observed classroom lesson by the medium of prepared films or television than by direct visitation in the classroom.

A rationale underlying the use of videotape in this study emanates from the need to provide an accurate record, which may be reviewed a number of times by different judges, for critically analyzing the frequency and duration of molecular segments of teacher-pupil behaviors, using a Rating Schedule constructed for this purpose. The major focus of the videotape content in this research was the student teacher in his actions and interactions with the class, in both group and individual contexts.

Statement of the Problem

Despite the growing evidence of the importance of both verbal and nonverbal mediums of communication in interpersonal situations, there are few studies which have systematically explored both verbal and nonverbal interactional phenomena in the classroom in terms that are operationally explicit, and replicably measurable. In general, studies which consider a class of verbal or nonverbal behaviors in the learning environment are limited in scope to programs designed to remediate specific pupil "problem" behaviors (e.g., out of seat behaviors, aggression, inattentiveness, and undesirable behavioral excesses or deficits; Ramp and Hopkins, 1971). Little material is available which looks at the variety of verbal and nonverbal behaviors by teachers and learners as they spontaneously manifest and interact in the classroom setting, seeking to determine relationships among

these naturally occurring events, and the conditions under which they manifest. In addition, the role of scheduled observation itself as a variable which may affect behaviors in the learning environment, has been essentially overlooked.

Efficient management of the learning milieu, effective implementation of learning activities, and productive behavioral programming designed to promote the acquisition of skills by learners are common goals in education. In order for these goals to be achieved, however, the educator must identify, appropriately manipulate, and control the relevant variables of which they are functions. This study seeks to provide data which may partially indicate what some of these pertinent variables are in terms of several teacher-learner behaviors, their relative occurrences in free-operant situations, and indices of the relationships among them. Further, it examines the effects of two observation schedules on teacher behaviors.

Specifically, this study is designed to provide basically descriptive, baseline data on classroom behaviors by teacher-interns and learners. Briefly, the research represents an experimental and exploratory study to determine the extent of statistical relationships among selected classes of observable verbal and nonverbal behaviors. The goals of the research are summarized as follows:

1. The development and field-testing of a Behavior Rating Schedule for multiple categories of verbal and nonverbal classroom behaviors by teacher-interns and learners;

2. Descriptive data on the relationships between multiple categories of verbal and nonverbal responses by teacher-interns and learners in the classroom;

3. Descriptive data on demographic variables as they relate to the above-mentioned behavioral categories;

4. An experimental analysis of the effects of manipulating Variable and Fixed Interval schedules of observation on multiple categories of verbal and nonverbal classroom behaviors by teacher-interns.

Statement of Hypotheses

Experimental Component.--Variable and Fixed Interval schedules of classroom observations shall be differentially related to verbal and nonverbal behaviors by teacher-interns.

Descriptive Component.--The following hypothesis predicts positive relationships between selected variables. It should be recognized at the outset, however, that measures of correlation are statistical estimates of the extent of association among variables, under a given set of conditions, and at a specific point in time. A high correlation between two variables allows for prediction of values for one variable from those of the other, but provides no justification for inferring any causal relationship among those variables.

The generic hypothesis states that there is a significant positive relationship between multiple approving verbal

and nonverbal classroom behaviors by teacher-interns and task-relevant verbal and nonverbal classroom behaviors by pupils.

Approving teacher-intern behaviors include (1) statements or comments of praise, approval, or confirmation of pupil behavior; (2) smiles; (3) positive physical contact which promotes care, comfort, or contentment of the pupil; (4) head-nods; (5) forward-lean of posture.

Task-relevant pupil behaviors include (1) answering teacher when called upon; (2) asking teacher questions of task-relevant nature; (3) discussing task-relevant topic; (4) gaze toward teacher or teacher-designated stimulus.

CHAPTER II

METHODS

Design and Components of the Study

This study contained two components: (1) an *experimental* manipulation of two interval schedules of classroom observation of teacher-interns; (2) a molecular *descriptive analysis* of the classroom behaviors of teacher-interns and learners. Multiple behavioral categories were codified and recorded on a *Behavior Rating Schedule* developed for this study, to be described later.

Experimental Component

The experiment used a two cell design with the basic comparison being of Variable and Fixed Interval schedules of videotaped observations of teachers. The two schedules were examined for their effects on the emission of multiple categories of verbal and nonverbal classroom behaviors by teacher-interns.

Descriptive Component

Concomitant objectives of this component were to provide basically descriptive, baseline data on: (1) emitted

occurrences of multiple categories of verbal and nonverbal classroom behaviors by teacher-interns and pupils; (2) the extent of statistical relationship among multiple categories of verbal and nonverbal classroom behaviors by teacher-interns and pupils.

The descriptive component allowed the Behavior Rating Schedule developed for this study to be field-tested in the natural setting afforded by the classroom. The resulting data yielded information which shall be used in subsequent research to determine the validity of the rating instrument.

Subjects

Selection of the Sample

In the summer of 1971 the College of Education at Michigan State University assumed the responsibility for the academic and experimental training of interns enrolled in the Federally sponsored Lansing Schools' Teacher Corps Program. The teacher-interns had completed an average of two years of undergraduate college course work, and represented great diversity in terms of their specialization in courses and their experiential background.

In the winter quarter, 1972, forty-six Teacher Corps teacher-interns were in their first quarter of in-service training in extensive teaching experience and concurrent course work in preparation for a baccalaureate degree in Education. By successfully completing the curricular requirements set

forth in the Teacher Corps program, met through the college of Education, the teacher-interns could earn a standard teaching credential with specialization in elementary teaching.

The entire population of forty-six Teacher Corps teacher-interns were selected as non-volunteer subjects. It is to be emphasized that these subjects are not teachers per se; they are sub-bacchalaureate level teacher-interns, engaged at the time of this study, in their first quarter of in-service training. Data from three of these subjects could not be acquired due to their being ill during the observation program. The remaining sample included forty-three subjects (N=43). Their ages ranged from 19-40, with a mean age of 25.65. Demographic data on a number of variables was generally available for most of the forty-three subjects. This data is given in Tables 1 and 2.

Research Setting

To fulfill requirements for their field training experience as teacher-interns, each subject was required to work an average of seventeen hours each week in supervised teaching practicums. The forty-three subjects were placed in kindergarten, first, second, third, fourth, fifth, and sixth grade classrooms for their student teaching. In one instance a single classroom contained mixed grades.

These classrooms were located in six Lansing metropolitan public elementary schools. The subjects were assigned by Teacher Corps staff to a teaching team consisting of seven to eight subjects, and directed by a supervising teacher. The

Table 1. Comparison by percent of response on demographic characteristics of the Teacher Corps sample.

Category	% of Ss who responded "yes"	n
Sex:		
Male	44	19
Female	56	24
Ethnicity:		
Black	38	16
White	21	9
Mexican-American	41	18
Married	48	20
Have dependent children	36	15
Served in U.S. Armed Forces	37	7
Speak a second language fluently[a]	30	12
Employed as a teacher prior to enrollment in Teacher Corps	5	2
Employed as teacher aide or assistant prior to enrollment in Teacher Corps	33	14
Undergraduate major in Education	63	26

[a]Of those who fluently spoke a second language, the language was Spanish, and the Ss were of Mexican-American ethnicity.

Table 2. Comparison of range and mean response on demographic characteristics of the Teacher Corps sample.

Category	Range of S response	Mean	n
Lived in low-income area (number of years)	1-30	9.13	23
Worked in low-income area (number of years)	1-21	3.64	22
Experience in employment prior to enrollment in Teacher Corps (number of years)	1-9	3.45	37
Monthly salary of last employment	$98-848	$388.65	37
Membership in civic, welfare, school, college, or social groups (number of groups)	1-3	1.41	24
Number of undergraduate quarter credit hours in education courses	0-68	14.71	24
Number of total undergraduate quarter credit hours	28-137	91.69	43
Overall undergraduate grade point average (4.00 scale)	1.00-3.60	2.53	43
Major undergraduate grade point average (4.00 scale)	2.00-4.00	3.00	24
Number of days into in-service training by date of observation	160-191	173.86	43

criteria for assigning subjects to teams included sex, ethnicity, and performance on tests of cognitive skills. This represented an attempt to stratify the composition of teams on those variables. To varying degrees, subjects accepted responsibility for the planning and direction of individual lessons and larger units of classroom activities. In general, the subjects worked with small groups containing less than twelve pupils. The remainder of the class was directed by a supervising teacher.

Subjects for Experimental Component

At the time the experiment was conducted, twenty-one of the forty-three Teacher Corps subjects were available for observations. Data were obtained from observations of the classroom behaviors of these twenty-one subjects, with a mean age of twenty-five. Nine of the subjects were male.

The subjects in three schools were assigned on a randomly determined basis to Group 1 (n_1=9); subjects in the remaining three schools were assigned to Group 2 (n_2=12). The subjects in Group 1 were each exposed to three videotaped observations on a Variable Interval schedule, with an average interval of eight days. The subjects in Group 2 were each exposed to three videotaped observations on a Fixed Interval schedule of fifteen days. The subjects were observed over a period of six weeks.

Subjects for Descriptive Component

In this phase of the research program data were obtained from videotaped observations of the classroom behaviors of forty-three subjects (N=43). This represented the full sample of available Teacher Corps teacher-interns.

Teacher Objects: Pupils

It will be recalled that the N in this study consists of teacher-interns. However, pupil responses were taken as a *subcategory of subject's* (teacher-interns') *behavior*. Teacher-interns' behavior was selected to be continuously monitored throughout the period of observation. Data are available only for those pupils who were within range of the videotape camera focused on the teacher-intern--a maximum radius of approximately 12 feet. With this in mind, it should be recognized that both the number of pupils observed for a given teacher-intern, and the length of time pupils were observed, varied. The sample of observed pupils included male and female children of white, black, and Mexican-American ethnicity. Approximately two-thirds of the pupils were white.

Instrumentation and Procedures

Equipment and General Procedures

In this study data collection required the use of a videotape recording unit. A Sony AV-3400 portable half-inch

videotape recorder which records both picture and sound on tape was used. The recorder allowed for sequences to be repeated, the entire tape to be replayed, and had a facility for stopping single pictures. Utilizing this latter mode was important in permitting nonverbal responses as well as verbal behaviors to be critically examined. Along with the recorder, a Sony AVC-3400 camera with built-in condenser microphone, and a Sony AC-3400 Power Adapter were used. Videotapes were played back on a Sony CVM-110 UA 12" video monitor. Sportcraft 60-second stop watches were used by judges in the analysis of videotaped observations.

The general method of classroom observation used a time sampling procedure. Time sampling assumes that, in a given situation, the behavior observed at selected intervals of time accurately represents the behavior occurring during the total interval. At predetermined intervals over a period of six weeks, each subject was videotaped by the experimenter for ten minute periods on each of at least two separate occasions. The observer entered and left the classroom as quietly as possible and avoided interactional contact with subjects and pupils.

An adaptation program was conducted prior to the actual data collection. In the adaptation program each subject was exposed over a two week period to a series of videotaped observations in the classroom. This program was

designed to minimize possible reactivity by subjects to both the videotape equipment and the operator using the equipment.

Behavior Rating Schedule

Introduction

The basic theoretical rationale for this study assumes that certain directly observable and measurable key attributes are associated with effective teaching. Whether the configuration of teacher behaviors are stable through time as Hughes (1959) concludes, or vary from observation to observation as Medley and Mitzel (1958) and Mitzel and Rabinowitz (1953) found, the problem involves reliably measuring changes in teacher behavior.

To accomplish this end, those behavioral characteristics that are important to observe, must be selected. What the investigator considers to be important derives from his theoretically based definitions of "good" and "bad" teaching. Teacher effectiveness, however, must be defined in terms of effects of change in pupil behavior. Hence, the variables to be observed must reflect teacher's actions and interactions with pupils.

Howsam (1960) indicates three methods by which teacher effectiveness may be measured: (1) by the effects the teacher has on the pupil; (2) by what behavior the teacher exhibits; (3) by the characteristics of the teacher. The variables in

teacher effectiveness research have often been difficult to quantify. The investigator encounters problems of adequate criteria, of controlling variables, and explicitely defining concepts; this latter factor especially representing a notable problem permeating educational research. The results of such research are often variably interpretable in terms of what exactly was observed and measured in the classroom, and the extent to which the measurement system accurately reflects actual classroom performances by teachers and pupils. This is a problem centering on the adequacy of operational definitions of concepts which the investigator seeks to measure. With this in mind, the present research largely addresses itself to the construction of a rating schedule which is explicitely operationalized, and which minimizes the role of subjective interpretation in rating classroom behaviors.

Development of the Behavior Rating Schedule

In developing an operationally explicit instrument designed to measure teaching behavior, with implications for teacher effectiveness, two prime objectives are herein defined: (1) an attempt is made to empirically identify behaviors and conceptual dimensions that may be used to help isolate objective responses which distinguish effective teaching from ineffective teaching performance; (2) the field-testing of the instrument in the natural setting afforded by the classroom represents the first part of a validation study

for the observation schedule. To this extent then, the resulting data derives from exploratory research, basically yielding a baseline profile of selected teacher-intern and pupil responses. The observations should result in describing elements of the teaching process and its relation to pupil behaviors. Emphasis is herein given to interactional contacts between teacher-interns and learners.

The observation schedule developed for this study represents an adaptation of concepts about observable behavior derived from the literature on verbal and nonverbal mediums of interpersonal communication (Argyle, 1969; Argyle and Kendon, 1967; Duncan, 1969), operantly oriented research in education (Birch, 1969; Carus, 1970; Hall, Lund, and Jackson, 1968; Madsen, Becker, and Thomas, 1968; O'Leary and O'Leary, 1972), and the investigator's own experiences.

The Behavior Rating Schedule was designed to meet the following criteria: (1) The Schedule describes selected significant aspects of the teacher-learner setting: (a) interactional contacts by teacher-interns and pupils; (1) teaching performance in classroom management and pedagogical method; (c) pupil performance in the classroom environment; (2) The measures consist of molecular categories of behavior which can be directly observed; (3) The role of unreliable judgment is minimized as much as possible.

Each behavioral concept was translated into a written, operationally defined item, designed to maximize uniformity among observers in recognizing and scoring the same acts. The resulting group of items was copied on stencil, duplicated onto pages, and assembled into separate packages for each teacher-intern rated. The package contained the operational definitions of the items, directions for scoring items, and space for scoring items. This was the instrument used by judges to evaluate videotapes of subjects' behaviors. A five minute segment of videotape was used for analysis for each teacher-intern.

The methods by which the actual variables were recorded on the Behavior Rating Schedule were as follows:

1. *Frequency counts* of discrete behavioral events each time the event occurred over the period of observation;

2. *Measures of duration*, or the period of time during which each separate instance of the behavior event occurred;

3. *Measures of latency*, the amount of elapsed time between a stimulus event and the onset of a subsequent behavioral event.

While it was previously mentioned that the raw data were extracted from five minute sections of videotape, it should be pointed out that different *periods of observation* were used for different groups of variables. For example, some variables used the entire five minute tape; other variables used a time sampling procedure in which ten periods of

observation were randomly selected from the tape and rated. The rationale for this differential procedure was based on initial pilot development which indicated that there was a wide variability between the base rate of different types of variables. For example, gaze direction was a constantly changing behavior which would have been impossible to monitor over the entire five minutes. In contrast, the frequency of smiles was a variable which could be relatively easily monitored over a five minute period. In addition, it was found useful to use stop action shots for some of the variables that were sampled. These general procedures resulted in two time frames of observation:

1. Five minute continuous samples of behavior;
2. Ten randomly selected samples of behavior from each five minute videotape section, for each subject. These time samples were either stop action shots, or were each of ten seconds duration.

Behavior Categories and Definitions

The behavioral categories developed for the study were quite workable. Table 3 lists the fifty-seven categories of classroom behaviors for teachers and teacher objects (pupils). Brief operational definitions are included with each item. Appendix A should be consulted for the complete

Table 3. Classroom behavior rating schedule.

Teacher Behaviors
Gesticulation
1. Baton Gesture. Movement of hand(s) and/or arm(s) which accents or emphasizes words or phrases. Movement must accompany speech.
2. Deictic Gesture. Movement of hand(s) pointing to an object(s) present in the classroom, or waving motion of hand(s) or arm(s). Movement may or may not accompany speech.
Body Acts
3. Locomotion Strength:Large Movement. Degree to which teacher moves body through classroom in movements of seven or more consecutive steps (a distance of three or more desks).
4. Locomotion Strength:Small Movement. Degree to which teacher moves body through classroom in movements of from one to six consecutive steps (a distance of less than three desks).
5. Locomotion Strength:Stationary. Degree to which teacher is stationary in geographic space, making no discernable movement by taking steps or walking in the classroom.
6. Locomotion Frequency. The total number of counted occurrences of Large Movement and Small Movement by teacher (items 3 & 4).
Body Orientation
7. Gross Posture. Position of teacher's body with reference to squatting or sitting beside pupil.
8. Gross Posture:Duration. The cumulative amount of time teacher was counted as squatting or sitting beside pupil.
9. Position of Trunk:Forward. Degree to which teacher's trunk is physically oriented toward (i.e., leaning in the direction of) pupil(s).
10. Position of Trunk:Erect. Degree to which teacher's trunk is physically oriented along a vertical axis, neither leaning toward nor away from pupil(s).
11. Position of Trunk:Backward. Degree to which teacher's trunk is physically leaning away from pupil(s).

Table 3 (Continued)

Facial Expression

12. Smile:Nondirectional. Degree to which teacher exhibits smiling behavior (position of mouth in up-turned expression) without regard to a given target.

13. Smile:Duration. The cumulative elapsed time between onset of smile and return of mouth to nonsmile expression for each counted occurrence of smile.

14. Frown. Degree to which teacher exhibits a frowning expression (position of eyebrows in knitted expression, forehead wrinkled).

Head Orientation

15. Head Nod. Degree to which teacher exhibits up-down motion of head relative to axis of shoulders, while looking at or toward pupil(s).

16. Head Shake. Degree to which teacher exhibits side-to-side motion of head relative to axis of shoulders, while looking at or toward pupil(s).

Physical Orientation

17. Proximity:Close. Degree to which teacher's body is within extended arm's reach of pupil(s).

18. Proximity:Distant. Degree to which teacher's body is beyond extended arm's reach of pupil(s).

Visual Orientation

19. Gaze Direction:Pupil. Degree to which teacher's direction of gaze is toward pupil's face.

20. Gaze Direction:Other. Degree to which teacher's direction of gaze is away from pupil's face.

Physical Contact

21. Physical Contact:Approving. Degree to which teacher exhibits physical contact with pupil(s) which promotes contentment, comfort, or care of the pupil.

22. Physical Contact:Approving--Duration. Cumulative duration of each counted occurrence of Approving Contact (item 21).

23. Physical Contact:Disapproving. Degree to which teacher exhibits physical contact with pupil(s) which disrupts or inhibits pupil's ongoing behavior.

Table 3 (Continued)

Punishment Procedures

24. Time-Out. Degree to which teacher removes pupil from classroom, isolates pupil by himself, turns back and waits for silence, turns lights out and says nothing.

25. Removal of Privilege. Enactment by teacher of removing pupil's rights, rewards, reinforcers, status, or privileges. Teacher must actively remove privileges and not merely threaten to remove them.

Verbal Behavior

26. Verbilization:Approving. Degree to which teacher emits verbalizations directed to pupil(s) which convey approval, praise, or confirmation of pupil's behavior. These verbalizations encourage pupil's behavior, and express pleasure by teacher.

27. Verbalization:Disapproving. Degree to which teacher emits verbalizations directed to pupil(s) which indicate disapproval of, or displeasure with, pupil's behavior. These verbalizations may disrupt pupil's ongoing behavior, and may include statements of threat of punishment or criticism.

28. Verbalization:Total Disapproving. Total number of counted occurrences of disapproving verbalizations by teacher (item 27).

29. Eliciting Verbal Elaboration. Degree to which teacher asks pupil(s) to explain or amplify own or other's statement, comment, or question.

30. Verbal Questions. Degree to which teacher asks pupil(s) a specific question calling for a direct, single verbal response.

Use of Instructional Aids

31. Usage of Blackbeard:Occurrences. The number of discrete instances in which teacher uses blackboard as instructional aid for pupil(s).

32. Usage of Blackboard:Duration. The amount of elapsed time in seconds for each discrete occurrence of teacher's usage of blackboard as instructional aid for pupil(s).

33. Usage of Instructional Material:Occurrences. The number of discrete instances in which teacher uses instructional materials (exclusive of blackboard) as instructional aid for pupil(s).

Table 3 (Continued)

34. Usage of Instructional Material:Duration. The amount of elapsed time in seconds for each discrete occurrence of teacher's usage of materials as instructional aid for pupil(s).

Teacher-Pupil Interaction

35. Interaction:Individual. Degree to which teacher exhibits verbal and nonverbal behavioral interaction (i.e., talking to, looking at, touching) with a single, individual pupil.

36. Interaction:Group. Degree to which teacher exhibits verbal and nonverbal behavioral interaction (i.e., talking to, looking at, touching) with two or more pupils at the same time.

37. Interaction:Undetermined. Category to be rated only if object of teacher's contact cannot be determined by judge.

Facial Attraction

38. Attraction:Pleasant/Unpleasant. Ordinal judgment by rater of perceived degree of teacher's facial attraction.

Teacher Object (Pupil) Behaviors

Verbal Behavior

39. Answering Teacher:Individual. Degree to which pupil answers teacher's question or responds verbally when called upon or recognized by teacher.

40. Spontaneously Answering Teacher:Individual. Degree to which pupil answers teacher's question or responds verbally to teacher without teacher's calling upon or recognizing pupil.

41. Answering Teacher:Group. Degree to which two or more pupils simultaneoulsy answer teacher or respond verbally when called upon or recognized by teacher.

42. Spontaneously Answering Teacher:Group. Degree to which two or more pupils simultaneously answer teacher's questions or respond verbally to teacher without teacher's calling upon or recognizing pupils.

43. Verbal Latency:Individual. Degree to which pupil delays emitting verbal response to teacher's question or request for verbal response, directed specifically to individual pupil.

Table 3 (Continued)

44. Verbal Latency:Group. Degree to which pupils delay emitting verbal response to teacher's question or request for verbal response, directed specifically to two or more pupils at the same time.

45. Asking Teacher Question(s). Degree to which pupil elicits teacher verbalization by asking teacher questions.

46. Discussion of Task. Degree to which pupil talks about assignment or task-relevant topic to teacher (excluding questions asked by pupil).

47. Task-Irrelevant Verbalization. Degree to which pupil's verbal responses are irrelevant and unrelated to teacher-designated topic or assignment.

48. Paralingualism. Degree to which pupil emits nonverbal vocalizations.

49. Eliciting Peer Verbalization. Degree to which pupil inappropriately elicits verbalizations by peers.

Visual Orientation

50. Gaze Direction:Toward Teacher. Degree to which pupil's direction of gaze is toward teacher or teacher-disignated stimulus.

51. Gaze Direction:Other. Degree to which pupil's direction of gaze is away from teacher or teacher-disignated stimulus.

Motor Activity

52. Gross Motor Activity. Degree to which pupil exhibits body activities involving gross muscular movements which have not been sanctioned, requested, or designated by teacher. This category is exclusive of Physical Contact responses.

Noisemaking Activity

53. Noisemaking. Degree to which pupil exhibits any nonverbal and nonvocal noisemaking activities which do not involve other persons and which are clearly identifiable and audibly detectable. These activities are not approved by teacher.

Mouthing

54. Mouthing Objects. Degree to which pupil brings object(s) into contact with mouth.

Table 3 (Continued)

Object Disturbance

55. Disturbance of Other's Property. Degree to which pupil disturbs other's property by grabbing, kicking throwing, or destroying property owned by another person.

Physical Contact

56. Physical Contact:Negative. Degree to which pupil exhibits physical contact which inhibits or disrupts ongoing behavior of the person touched.

57. Physical Contact:Positive. Degree to which pupil exhibits physical contact which promotes comfort, contentment, or care of the person touched.

Behavior Rating Schedule, containing expanded definitions, examples, and procedures for scoring categories.

Data Collection Procedures

Analysis of Videotape

Data from the analysis of videotapes for the experimental component were used to test the experimental hypothesis and to estimate the treatment effects of the independent variables. For the descriptive component, data were used to test the non-experimental hypothesis and to estimate the extent of statistical interrelationships among the variables considered.

Data were collected by four trained judges who observed and rated the same videotape content for each subject. The basic data were collected from observations of five minutes duration for each subject. The judges were one male and three female undergraduate students who were paid an hourly salary for their work. One judge was white; the other judges were black. The order in which subjects were rated was randomly determined. Each judge independently rated the behavioral categories for each subject in the same randomized order. The investigator was not present when judges rated subjects during the data collection phase of the study.

Forty-four behavior categories were rated using the entire five minute videotape for the rating. Thirteen

behavior categories were rated using the time sampling procedure outlined on pp. 44-45. A time sample unit for each category rated by this method consisted of ten discrete still pictures, or ten discrete sequences, each of ten seconds duration. Time sampled items for each subject were transcribed onto a single videotape to facilitate their rating. The time samples were randomly selected from the original five minute videotape for each subject. Each discrete time sample was a discriminable separate unit, identifiable by a visual signal inserted between each sample per category, and between each time sample category. The judges rated time sampled items at one time, after they had completed the forty-four items to be rated from the full five minute videotape. Each judge rated the same sample, for each subject, in the same order. Time sampled variables were recorded by frequency of occurrence each for a total of ten samples.

An attempt was made to control for effects of possible contamination of ratings of nonverbal behaviors by verbal cues. Judges were required to rate nonverbal items without audio feedback. This reduced the liklihood that judges would be influenced in their ratings of nonverbal items by accompanying comments made by subjects.

Training of Raters

A training program was conducted to instruct the four judges in the usage of the Behavior Rating Schedule developed for this research. The judges were supervised by the investigator in a series of joint and independent exercises rating each of the fifty-seven behavior categories under study. The investigator served as expert judge. Each judge rated the behaviors of teacher-interns and teacher objects (pupils) from several demonstration videotapes containing examples of each category to be rated. The judges discussed the items and examined particular examples of behavior on which there appeared to be disagreement in rating. The videotapes used for the training program were not used in the data collection phase of research. The total amount of training time did not exceed fifteen hours.

Estimation of Reliability

Inter-rater reliability should serve as a measure of the clarity of operational definitions and the discreteness of the categories. Data in the present study was in the form of mean ratings by the four judges for each behavior category considered. As an index of inter-rater reliability, intra-class correlation coefficients were computed by analysis of vairance (Ebel, 1951; see Appendix B for computational procedure) yielding an estimate of reliability of average ratings by the four judges for each of the fifty-seven behavioral

variables examined. The thirty-eight coefficients for teacher-interns ranged from .52 to .99; 71 percent of the coefficients were higher than .80. The nineteen coefficients for pupils ranged from .39 to .97; 58 percent of the coefficients were higher than .80. Table 4 presents the correlation coefficients of the four judges average ratings for each item in the Behavior Rating Schedule.

Data Analysis Procedures

The mean of the ratings obtained by the four judges was computed to serve as the best estimate for each behavior category, and represented the data for this study. Data from the experimental component, for the thirty-eight teacher categories, were submitted to statistical analysis by a "two-tailed" *t*-test. Inasmuch as the assumptions underlying a *t*-test for homogeneous variance could not be met in all cases, a *t*-test for heterogeneous variance was computed where appropriate (see Garrett, 1971). The results of the *t*-test indicate the extent to which differences between the means of two groups may be attributed to the effects of the independent variable. We will use a criterion level of $p < .05$ for indicating a significant difference.

Data from the descriptive component were for fifty-seven teacher-teacher object (pupil) behavior categories. In addition, twenty-two demographic variables were examined for levels of statistical relationship with each of the

Table 4. Intraclass correlation coefficients of average ratings by four judges for the 57 items in the Behavior Rating Schedule.

Category	Correlation Coefficient (Average Rating by Judges)
Teacher Behaviors	
1. Baton Gesture	.91
2. Deictic Gesture	.90
3. Locomotion Strength: Large Movement	.93
4. Locomotion Strength: Small Movement	.94
5. Locomotion Strength: Stationary	.95
6. Locomotion Frequency	.94
7. Gross Posture	.89
8. Gross Posture: Duration	.89
9. Position of Trunk: Forward	.96
10. Position of Trunk: Erect	.96
11. Position of Trunk: Backward	.86
12. Smile: Non-directional	.90
13. Smile: Duration	.94
14. Frown	.58
15. Head Nod	.91
16. Head Shake	.57
17. Proximity: Close	.88
18. Proximity: Distant	.81
19. Gaze Direction: Pupil	.90

Table 4 (Continued)

Category	Correlation Coefficient (Average Rating by Judges)
20. Gaze Direction: Other	.90
21. Physical Contact: Approving	.93
22. Physical Contact: Approving-Duration	.85
23. Physical Contact: Disapproving	.46
24. Time-Out	.54
25. Removal of Privileges	.84
26. Verbalization: Approving	.92
27. Verbalization: Disapproving	.91
28. Verbalization: Total Disapproving	.87
29. Eliciting Verbal Elaboration	.77
30. Verbal Questions	.99
31. Usage of Blackborad: Occurrences	.99
32. Usage of Blackborad: Duration	.99
33. Usage of Instructional Material: Occurrences	.89
34. Usage of Instructional Material: Duration	.94
35. Interaction: Individual	.95
36. Insteraction: Group	.84
37. Interaction: Undetermined	.52
38. Facial Attraction	.65

Table 4 (Continued)

Category	Correlation Coefficient (Average Rating by Judges)
Teacher Object (Pupil) Behaviors	
39. Answering Teacher: Individual	.84
40. Spontaneously Answering Teacher: Individual	.86
41. Answering Teacher: Group	.96
42. Spontaneously Answering Teacher: Group	.84
43. Verbal Latency: Individual	.93
44. Verbal Latency: Group	.97
45. Asking Teacher Questions	.76
46. Discussion of Task	.72
47. Task-Irrelevant Verbalization	.77
48. Paralingualism	.39
49. Eliciting Peer Verbalization	.82
50. Gaze Direction: Toward Teacher	.94
51. Gaze Direction: Other	.52
52. Gross Motor Activity	.92
53. Noisemaking	.75
54. Mouthing Objects	.58
55. Disturbance of Other's Property	.46
56. Physical Contact: Negative	.91
57. Physical Contact: Positive	.90

behavioral variables. The basic method of data analysis employed in this component is as follows: correlational analyses of both behavioral and demographic data were conducted to determine the extent of statistical relationships among those variables. The statistical technique selected to analyze these data is Tryon and Bailey's (1970) methods of cluster analysis. Its procedures are based on domain sampling principles. These methods contain components designed to reduce n variables to a composite, comparatively discrete set of K general variables or dimensions (V-Analysis), and of reducing n discrete individuals to P contrasting types of individuals (O-Analysis).

In this study the V-Analysis was used to define the empirical clusters. This allowed for determination of the extent of statistical relationship among the several variables examined, and identification of those variables which were most significant in terms of composites which they defined, and discrete dimensions which they formed. In regard to the behavior rating instrument designed for this study, identification of the definer items of behavioral categories permit their extraction from the rating schedule, and shall allow for a reconstruction of the device at a later date. Both behavioral response variables and demographic variables were studied in this empirical V-Analysis.

After the cluster definers were identified, a Preset Key-Cluster Analysis (a special case of the empirical

V-Analysis), was then conducted on the behavioral response variables. The demographic variables were deleted from further analysis. The objective of the preset analysis was to refine and further clarify the discrete structure of those clusters which were most reliable and which accounted for the greatest amount of variance. Essentially, the preset analysis further reduces n variables to a composite, discrete set of more general variables. For the preset analysis, those composite variables were deleted which had reliability coefficients of cluster scores on the full set of defining variables, lower than .95, and/or which contained a variable which was a definer of more than one cluster, and/or a cluster having great specificity and which was defined by a doublet. These criteria for eliminating dimensions are consistent with Tryon and Bailey's (1970) recommendations for generating meaningful clusters. Only those definers having the highest reliability ($r > .50$) and communality with a remaining, rationally selected cluster were added to the appropriate dimension by the analyst. Those variables having factor loadings below .40 and with a communality below .20 are generally excluded from the V-Analysis.

Following the preset analysis, an O-Analysis was conducted on the behavioral variables to determine the extent to which individual subjects in the study form distinct typologies of the basis of their patterns of cluster scores on

the behavioral categories examined. If individual score profiles fall into discrete groups or types, it may indicate that particular patterns of behavior are generated with high frequency by a variable(s) meriting examination (Tryon and Bailey, 1970).

It will be recalled that in a previous section (pp. 31-32) a general hypothesis was made regarding the descriptive component of the study. In terms of the above-outlined procedures for the cluster analysis, some discrete rules for determining whether the predicted relationships exist can be formulated. These criteria are essentially twofold: (1) If two variables, or groups of variables, which are predicted to be related appear in the same cluster domain, then a relationship is supported; (2) If two groups of variables appear in different clusters, but the two clusters are highly related, then support for a relationship is indicated.

CHAPTER III

RESULTS

Experimental Component

To test the hypothesis that Variable and Fixed Interval schedules of classroom observation of teacher-interns have a differential effect between groups, a non-directional *t*-test was computed on the data. The comparisons between Group 1 (Variable Interval schedule) and Group 2 (Fixed Interval schedule) are presented in Table 5. Results are applicable only for *teacher-interns*, each of whom were observed on three separate occasions. The pupils observed with teacher-interns on one occasion were often different from those observed with the same teacher-interns on subsequent occasions. As would be expected where there is no control over instructional activities with a specific individual or group of pupils, in a class of 20-40 children, it would be unlikely that a series of random observations would consistently find teachers interacting with the same pupils. Further, due to the technical limitations imposed by the videotape recording device, it was impossible to monitor the entire class. It will be recalled that the camera was continually focused on the subject

Table 5. t-ratio (two-tailed) for behavioral response categories by schedule of observation for Group 1 (Variable Interval schedule) and Group 2 (Fixed Interval schedule).

Behavior Category	Group 1 (VI Observation Schedule) $n_1=9$ MEAN	Group 2 (FI Observation Schedule) $n_2=12$ MEAN	t
Gesticulation			
1. Baton Gesture	5.22	2.16	1.35**
2. Deictic Gesture	9.69	6.56	1.80
Body Acts			
3. Locomotion Strength: Large Movement	.22	.16	.23
4. Locomotion Strength: Small Movement	1.44	1.08	3.21*
5. Locomotion Strength: Stationary	8.33	8.75	.47
6. Locomotion Frequency	1.61	1.21	.46
Body Orientation			
7. Gross Posture	.58	.95	.88
8. Gross Posture:Duration	52.41	100.50	1.10
9. Position of Trunk:Forward	2.25	3.29	.87
10. Position of Trunk:Erect	7.64	6.63	.87
11. Position of Trunk: Backward	.11	.08	.25
Facial Expression			
12. Smile:Nondirectional	1.03	.90	.18
13. Smile:Duration	3.44	2.40	.37
14. Frown	.02	.10	.58**
Head Orientation			
15. Head Nod	3.28	2.46	.74
16. Head Shake	.30	.87	1.55**
Physical Orientation			
17. Proximity:Close	7.06	9.23	2.13**
18. Proximity:Distant	2.69	.77	2.09

Table 5 (Continued)

Behavior Category	MEAN	MEAN	t
Visual Orientation			
19. Gaze Direction: Toward Pupil	6.08	6.42	.32
20. Gaze Direction:Other	3.92	3.58	.32
Physical Contact			
21. Physical Contact: Approving	.38	.75	.97
22. Physical Contact: Approving-Duration	1.50	1.52	.01**
23. Physical Contact: Disapproving	.02	.06	.21**
Punishment Procedures			
24. Time-Out	.94	1.00	1.01
25. Removal of Privilege	1.00	1.00	.00
Verbal Behavior			
26. Verbalization:Approving	4.69	5.58	.61**
27. Verbalization: Disapproving	1.06	.25	2.09**
28. Verbalization:Total Disapproving	1.03	.16	2.23**
29. Eliciting Verbal Elaboration	.63	.39	.56**
30. Verbal Questions	3.64	5.63	1.22
Usage of Instructional Aids			
31. Usage of Blackboard: Occurrences	2.58	1.00	1.97
32. Usage of Blackboard: Duration	79.88	1.00	2.57
33. Usage of Instructional Material:Occurrences	1.67	3.48	2.18
34. Usage of Instructional Material:Duration	79.81	193.00	2.65
Teacher-Pupil Interaction			
35. Interaction-Individual	111.03	178.65	1.81
36. Interaction-Group	159.19	118.44	.94
37. Interaction-Undetermined	52.44	42.86***	.60**
Facial Attraction			
38. Attraction:Pleasant/ Unpleasant	1.92	1.88	.36

NOTE: Calculation of variance ratios revealed that 11 of the 38 categories had unequal variances between Group 1 and Group 2. In these cases a t-test for heterogeneous variance was computed.

*p < .05. **t-ratio for heterogeneous variance ***n=10

(teacher-interns) throughout the period of observation. Hence, only those pupils who were within the radius of camera-range could be observed, thereby allowing for their behaviors to be subsequently rated by the judges viewing the videotaped observations.

With respect to the statistical procedures used to analyze the data for this component, it is to be noted that in those cases where variance ratios indicated that the assumption for homogeneous variance could not be met, a *t*-test for heterogeneous variance (see Garrett, 1971) was computed. The results of the *t*-tests indicate that only one of the thirty-eight items reached an acceptable level of significance between groups. In terms of procedures for evaluating the significance of such a series of statistical tests (see Sakoda, Cohen, and Beall, 1954), these results are not supportive of an experimental effect. It is concluded that the hypothesis predicting significant differential effects between treatment groups, is not supported by the data.

Descriptive Component

Preview of the Cluster Analyses

The data for this study were submitted to four separate cluster analyses (Tryon and Bailey, 1970) to identify common patterns among variables and objects which

form relatively discrete, homogeneous dimensions. Aside from the defining variables, only those items having factor leadings of ± .40 or better in a given cluster were included in that dimension. Variables with communalities below .20 were rejected and not assigned to a cluster domain. In Table 6 are presented the group means and standard deviations for occurrences of the fifty-seven teacher-pupil behavior categories which are to be cluster analyzed. The group mean for each category was computed by summing the total number of occurrences per category and dividing the results by the total number of subjects rated per category (N=43).

Initially an empirical V-Analysis was executed on the fifty-seven behavioral and twenty-two demographic variables included in the study (see Tables 1 and 2). In addition to those variables, the subjects' score on the Val-Ed Firo B scale was included in this initial empirical run. The results yielded ten clusters, five of which were defined exclusively by demographic items. No noteworthy relationships between demographic and behavioral factors were indicated. Consequently, the demographic variables were deleted from subsequent analyses, serving to eliminate variance contributed by those factors, and to allow a more intensive focus on the behavioral variables alone.

A second empirical V-Analysis was subsequently conducted only on the set of behavioral variables, which

Table 6. Group means and standard deviations for categories of observed classroom behaviors by teacher-interns and teacher objects (pupils).

Behavior Category	Mean (N=43)	SD (N=43)
TEACHER		
Gesticulation		
1. Baton Gesture	3.19	4.75
2. Deictic Gesture	7.03	3.84
Body Acts		
3. Locomotion Strength:Large Movement	.26	.65
4. Locomotion Strength:Small Movement	.89	1.36
5. Locomotion Strength:Stationary	8.84	1.75
6. Locomotion Frequency	1.17	1.74
Body Orientation		
7. Gross Posture	.75	.94
8. Gross Posture:Duration	90.18*	104.22
9. Position of Trunk:Forward	3.34	2.98
10. Position of Trunk:Erect	6.39	2.99
11. Position of Trunk:Backward	.07	.25
Facial Expression		
12. Smile:Nondirectional	1.14	1.67
13. Smile:Duration	3.17*	5.71
14. Frown	.05	.20
Head Orientation		
15. Head Nod	2.33	2.15
16. Head Shake	.54	.91
Physical Orientation		
17. Proximity:Close	8.70	2.32
18. Proximity:Distant	1.02	1.69
Visual Orientation		
19. Gaze Direction:Pupil	5.87	1.99
20. Gaze Direction:Other	4.13	1.99
Physical Contact		
21. Physical Contact:Approving	.77	1.60
22. Physical Contact:Approving-Duration	1.80*	3.23
23. Physical Contact:Disapproving	.05	1.48

Table 6 (Continued)

Behavior Category	Mean (N=43)	SD (N=43)
Punishment Procedures		
24. Time-Out	.01	.08
25. Removal of Privilege	.02	.15
Verbal Behavior		
26. Verbalization:Approving	4.90	3.76
27. Verbalization:Disapproving	.55	1.13
28. Verbalization:Total Disapproving	.47	1.02
29. Eliciting Verbal Elaboration	.61	1.09
30. Verbal Questions	6.14	5.56
Use of Instructional Aids		
31. Usage of Blackboard:Occurrences	.84	1.74
32. Usage of Blackboard:Duration	32.12*	68.55
33. Usage of Instructional Material: Occurrences	2.26	1.85
34. Usage of Instructional Material: Duration	145.53*	107.04
Teacher-Pupil Interaction		
35. Interaction:Individual	189.72*	96.13
36. Interaction:Group	108.52*	94.99
37. Interaction:Undetermined	40.42*	33.83
Facial Attraction		
38. Attraction:Pleasant/Unpleasant	2.31**	2.78
TEACHER OBJECT (PUPIL)		
Verbal Behavior		
39. Answering Teacher:Individual	12.16	10.55
40. Spontaneously Answering Teacher: Individual	1.58	3.57
41. Answering Teacher:Group	2.30	5.25
42. Spontaneously Answering Teacher: Group	.57	1.15
43. Verbal Latency:Individual	2.47***	3.19
44. Verbal Latency:Group	1.94***	3.83
45. Asking Teacher Questions	.72	.83
46. Discussion of Task	1.37	3.01
47. Task-Irrelevant Verbalization	.55	1.14
48. Paralingualism	.10	.21
49. Eliciting Peer Verbalization	1.43	1.76

Table 6 (Continued)

Behavior Category	Mean (N=43)	SD (N=43)
Visual Orientation		
50. Gaze Direction:Toward Teacher	23.53	10.29
51. Gaze Direction:Other	5.05	4.76
Motor Activity		
52. Gross Motor Activity	2.70	3.07
Noisemaking Activity		
53. Noisemaking	.41	.68
Mouthing		
54. Mouthing Objects	2.17	1.44
Object Disturbance		
55. Disturbance of Other's Property	.10	.25
Physical Contact		
56. Physical Contact:Negative	.27	.88
57. Physical Contact:Positive	.73	1.41

NOTE: The rated period of observation was five minutes (300 seconds).

*Measure of duration in seconds.

**Ordinal judgment.

***Measure of latency in seconds.

yielded nine behavioral dimensions. Some of the resulting clusters represented poor solutions by their extreme specificity, poor communality, or non-exclusive definers. In order to generate more adequate and representative clusters, a number of highly reliable definers derived from the empirical analysis were preset to produce revised dimensions (Preset Key-Cluster Analysis, Tryon and Bailey, 1970). Thus, a preset cluster analysis was performed. The resulting clusters represented more generalizable, homogeneous, and independent dimensions for analysis.

Finally, an O-Analysis was run on the behavioral dimensions derived from the preset analysis to identify common typological patterns present in the subject sample. Three relatively homogeneous O-types emerged for analysis, and subjects were assigned to their respective O-types.

Cluster Analysis of Behavioral and Demographic Variables

The Clusters and Their Interrelationships

The clusters obtained for the full set of behavioral and demographic variables are presented in Table 7. The correlations between oblique cluster domains (correlations between the rotated oblique factors) are presented in Table 8.

Table 7. Empirical V-Analysis of behavioral and demographic variables.

Cluster		Loading
1.	Positive Task-Relevant Teacher-Intern and Pupil Interaction	
	A. Smiling-Attractive Teacher-Intern	
(D)	1. Intern is attractive (judgment) (Teacher Attraction:Pleasant/Unpleasant)	.98
	2. Intern smiles longer (Teacher Smile:Duration)	.57
	3. Intern smiles more often (Teacher Smile:Nondirectional)	.45
	B. Pupil Pondering	
(D)	1. Student group thinking time (Pupil Verbal Latency:Group)	.99
(D)	2. Individual student thinking time (Pupil Verbal Latency:Individual)	.96
	3. Pupil mouthing object (Pupil Mouthing Object)	.42
	C. Pupil Responsiveness	
(D)	1. Pupils discuss more (Pupil Discussion of Task)	.96
	2. Individual students responds more spontaneously (Pupil Spontaneously Answering Teacher: Individual)	.93
	3. Individual pupil answers teacher more often (Pupil Answering Teacher:Individual)	.72
2.	Teacher-Intern Observation and Group Interaction	
	A. Motor Active Teacher-Intern	
(D)	1. Intern moves about classroom (Teacher Locomotion Strength:Stationary)	.98
(D)	2. Intern moves about classroom for short distance (Teacher Locomotion Strength:Small Movement)	.98

Table 7 (Continued)

Cluster		Loading
(D)	3. Intern moves often about classroom (Teacher Locomotion Frequency)	.97
	4. Intern is beyond reach of pupil (Teacher Proximity:Distant)	.64
	5. Intern seldom exhibits long distance movements in classroom (Teacher Locomotion Strength:Large Movement)	.58
	6. Intern is beyond reach of pupil (Teacher Proximity:Close)	.49
	B. Observation/Group Interaction	
(D)	1. Intern often gestures emphatically (Teacher Baton Gesture)	.69
	2. Intern often looks toward pupil (Teacher Gaze Direction:Pupil)	.54
	3. Intern seldom looks away from pupil (Teacher Gaze Direction:Other)	.54
	4. Interns seldom interact with individual (Teacher Interaction:Individual)	.52
	5. Intern often interacts with groups (Teacher Interaction:Group)	.49
	6. Intern seldom uses instructional materials for long periods of time (Teacher Usage of Instructional Materials:Duration)	.47
	C. Group Responsiveness	
	1. Pupils answer teacher more often (Pupil Answering Teacher:Group)	.45
3.	Teacher-Interns' Disapproval of Task-Irrelevant Behavior	
	A. Intern Disapproval During Instruction	
(D)	1. Intern speaks disapprovingly to pupil (Teacher Verbalization:Total Disapproving)	.95

Table 7 (Continued)

Cluster		Loading
(D)	2. Intern speaks disapprovingly to pupil (Teacher Verbalization:Disapproving)	.94
	3. Intern disapprovingly touches pupil (Teacher Physical Contact:Disapproving)	.51
	4. Intern makes prolonged use of blackboard (Teacher Usage of Blackboard:Duration)	.46
	5. Intern leans away from pupil in interaction (Teacher Position of Trunk:Backward)	.41
	B. Pupil Misbehavior	
(D)	1. Pupil makes unnecessary noise (Pupil Noisemaking Activity)	.88
(D)	2. Pupil emits nonverbal vocal noises (Pupil Paralingualism)	.80
	3. Pupil moves about in seat or wanders around room (Pupil Gross Motor Activity)	.75
	4. Pupil talks out inappropriately to peers (Pupil Eliciting Peer Verbalization)	.69
	5. Pupil approvingly touches another person (Pupil Physical Contact:Positive)	.51
4. Positive Teacher-Intern Contact		
	A. Teacher-Intern Approvingly Touches Pupil	
(D)	1. Intern approvingly touches pupil for prolonged periods (Teacher Physical Contact:Approving-Duration)	.95
(D)	2. Intern often approvingly touches pupil (Teacher Physical Contact:Approving)	.86
5. Senior Work-Experienced Teacher-Interns		
	A. Work Experienced Teacher-Interns	
(D)	1. Intern has extensive work background (Formal Employment Experience)	.95

Table 7 (Continued)

Cluster	Loading
(D) 2. Intern has had high paying job (Salary of Last Employment)	.79
B. Senior Married Teacher-Interns	
(D) 1. Older teacher-interns (Teacher:Age)	.82
2. Intern is married (Teacher:Marital Status)	.59
3. Intern has children (Teacher:Dependent Children)	.47
6. Verbally Probing Teacher-Interns	
A. Verbally Elicitative Teacher-Interns	
(D) 1. Intern asks more questions (Teacher Verbal Questions)	.93
(D) 2. Intern more often praises pupil (Teacher Verbalization:Approving)	.65
(D) 3. Intern often asks pupil to amplify on remarks or comments (Teacher Eliciting Verbal Elaboration)	.64
B. Classroom Experienced Teacher-Interns	
1. Intern has more classroom experience (Teacher:Experience as Teacher's Aide or Assistant)	.42
7. Teacher-Interns From Low Income Background	
A. Low Socio-Economic Background	
(D) 1. Intern has worked longer in low-income area (Teacher:Number of Years Worked in Low Income Area)	.94
(D) 2. Intern has lived longer in low-income area (Teacher:Number of Years Lived in Low Income Area)	.75

Table 7 (Continued)

Cluster	Loading
B. Interns' New to Teaching	
(D) 1. Intern has not been employed as teacher (Teacher:Employment Experience as Teacher)	.81
8. Male Veteran Teacher-Interns	
A. Male Veteran Interns	
(D) 1. Male interns (Teacher:Sex)	.99
(D) 2. Intern has military experience (Teacher:Served in U.S. Armed Forces)	.94
3. Intern is Mexican-American (Teacher:Ethnicity)	.48
9. Lower Socio-Economic and Academic Background	
A. Low Academic and Income Teacher-Interns	
(D) 1. Intern has lower grades in school (Teacher:Major Undergraduate Grade Point Average)	.86
2. Intern has worked in volunteer organizations (Teacher:Active in Volunteer, Unpaid Work)	.48
3. Intern has few credits in Education (Teacher:Undergraduate Credits in Education)	.45
4. Intern has lived longer in low-income area (Teacher:Number of Years Lived in Low Income Area)	.44
B. Nondemonstrative Teacher-Interns	
1. Intern seldom uses blackboard (Teacher Usage of Blackboard: Occurrences)	.59

Table 7 (Continued)

Cluster	Loading
2. Intern seldom gestures (Teacher Deictic Gesture)	.43
3. Intern seldom nods head approvingly (Teacher Head Nod)	.41
C. Observation Schedule	
(D) 1. More subjects observed on VI Observation schedule (Teacher:Observed on Variable Interval Schedule of Observation)	.82
10. White High Academic Achievers	
A. Predominantly White Academic Achievers	
(D) 1. Intern has higher Val-Ed score (Teacher:Val-Ed Pre-Test Score)	.69
(D) 2. Intern has higher grade point average (Teacher:Overall Undergraduate Grade Point Average)	.63
3. More interns are white (Teacher:White)	.63
4. Few interns are black (Teacher:Black)	.55

NOTE: (D) denotes a definer item for the cluster.

Table 8. Correlations between oblique cluster domains for the empirical clusters.

Clusters	1	2	3	4	5	6	7	8	9	10
1. Positive Task-Relevant Teacher-Intern and Pupil Interaction	--	.07	-.06	-.11	-.15	.19	.00	.18	-.06	-.07
2. Teacher-Intern Observation and Group Interaction	.07	--	-.02	.12	-.03	-.16	-.19	-.27	-.05	-.02
3. Teacher-Interns' Disapproval of Task-Irrelevant Behavior	-.06	-.02	--	-.09	.09	-.11	-.10	-.01	-.32	.12
4. Positive Teacher-Intern Contact	-.11	.12	-.09	--	-.05	-.07	-.14	.14	.20	.14
5. Senior Work-Experienced Teacher-Interns	-.15	-.03	.09	-.05	--	-.16	.09	.06	-.11	.14
6. Verbally Probing Teacher-Interns	.19	-.16	-.11	-.07	-.16	--	-.12	.11	.19	.05
7. Teacher-Interns From Low Income Background	.00	-.19	-.10	-.14	.09	-.12	--	.09	.06	-.18
8. Male Veteran Teacher-Interns	.18	-.27	-.01	.14	.06	.11	.09	--	.28	-.00
9. Lower Socio-Economic Academic Background	-.06	-.05	-.32	.20	-.11	.19	.06	.28	--	-.43
10. White High Academic Achievers	-.07	-.02	.12	.14	.14	.05	-.18	-.00	-.43	--

Description and Interpretation of the Clusters

The following is a descriptive summary of the conceptual themes represented by each of the ten cluster domains. Within each cluster, variables have been grouped in terms of more coherent conceptual sub-categories. In turn, individual variables are labeled both in terms of a descriptive sentence or phrase, and parenthetically in terms of their formal designation (see Table 3). Definers of clusters have been designated by a capital D.

Cluster 1, Positive Task-Relevant Teacher-Intern and Pupil Interaction.--This cluster is defined by variables reflecting pleasant, task-oriented teacher-intern and pupil interactions, primarily with individual students. Teachers' facial attraction appears largely to reflect a pleasant facial expression in the form of smiles; longer and more frequent smiles by teacher-interns are related to increments in task-relevant pupil responsiveness. Pupils' verbal response latency might be conceptualized as a cognitive factor indicative of "thinking time." It appears overall that pupils' enthusiastic, task-related verbal behaviors tend to be related to teacher-interns' nonverbally pleasant, approving disposition toward pupils in general. The cluster appears to have only limited relationship to the other dimensions, as seen in Table 8. There are slight relationships to Cluster 6 (Verbally Probing Teacher-Interns, r = .19),

Cluster 8 (Male Veteran Teacher-Interns, r = .18), and Cluster 5 (Senior Work-Experienced Teacher-Interns r = -.15). The former relationship could be explicable on a common-sense basis with probing teacher-interns assumed to elicit greater "thinking" but more enthusiasm. In addition, there seems to be a tendency for male Mexican-American teacher-interns to be more probing and pleasant in classroom interaction, and for older, married, work-experienced teacher-interns to be associated with less probing, pleasant, enthusiastic interactions with pupils under observed conditions. The reliability of Cluster 1 is .99.

Cluster 2, Teacher-Intern Observation and Group Interaction.--This cluster is defined by variables reflecting teacher-interns' gross movements in the classroom. The pattern of correlations indicate that teacher-interns' movements tend to be small (less than seven consecutive steps) and frequent, often accompanied by demonstrative gestural expressions in group interactions. Teacher-interns appear generally to look toward students who are some distance away, and are more likely to move toward and interact with, a group of pupils rather than a specific individual. This suggests that the teacher-intern is monitoring segments of the class as a whole, attending to small groups as attention is directed to them during, for example, a lecture or study period. Verbal responsiveness by the group, as contrasted to the individual, is high under these conditions.

The cluster is slightly negatively related to Cluster 8 (Male Veteran Teacher-Interns r = -.27), Cluster 7 (Teacher-Interns From Low Income Background, r = -.19), and Cluster 6 (Verbally Probing Teacher-Interns r = -.16). Apparently male Mexican American teacher-interns are unlikely to engage in highly motor active, observational group interactions with students under observed conditions. Rather, they tend to be quite verbally active and expressively pleasant with individual pupils, as seen in Cluster 1. Verbally probing teacher-interns appear to exhibit little movement and tend neither to observe the class, nor to elicit group responses. Verbal probing is primarily directed toward individuals. The reliability of Cluster 2 is .96.

Cluster 3, Teacher-Intern Disapproval of Task-Irrelevant Behavior.--This cluster is defined by variables reflecting teacher-interns' verbal disapproval of noisey pupils. Task-irrelevant motor movements, vocal and non-verbal noisemaking activities, and talking out of turn to peers tend to be associated with critical, "punishing" remarks by teacher-interns. It appears that pupils task-irrelevant behaviors and teacher-interns' negative comments often manifest when teacher-interns use the blackboard for long periods of time. Possibly pupils are bored into activity of some kind; they may simply want to participate actively in the learning process rather than passively observe beyond a certain limit. The cluster is moderately

negatively related to Cluster 9 (Lower Socio-Economic Academic Background, r = -.32). The cluster has a reliability of .95.

Cluster 4, Positive Teacher-Intern Contact.--This doublet cluster reflects only approving physical contact by teacher-interns. It seems that frequency and length of approvint contact are strongly related. The more often approving contact occurs, the longer each episode will last. The cluster is slightly related to Cluster 9 (Lower Socio-Economic Academic Background, r = .20). It seems that there is a tendency for non-demonstrative teacher-interns from a lower socio-economic background, with a lower academic record and fewer credits in Education courses, to more often approvingly touch pupils, and for a longer duration of time. The cluster has a reliability of .91.

Cluster 5, Senior Work-Experienced Teacher-Interns.--This cluster is defined by demographic items, and merely indicates that older teacher-interns tend to have had more formal long-term work experience and higher salaries than younger subjects in the sample. Older teacher-interns tend more often to be married and to have children. This cluster is slightly negatively related to Cluster 1 (Positive Task-Relevant Teacher-Intern and Pupil Interaction, r = -.15) and Cluster 6 (Verbally Probing Teacher-Interns r = -.16). The limited relationship of this dimension to Cluster 1 has previously been described. Older, married subjects with longer employment records tend not to be engaged in positive,

task-oriented interactions with students. In addition, these teacher-interns tend not to elicit comments by pupils, nor to praise them verbally, under observed conditions. The reliability of the cluster is .88.

Cluster 6, Verbally Probing Teacher-Interns.--This cluster is defined by variables reflecting teacher-interns elicitative and praising verbal behaviors. It appears that teacher-interns who more frequently ask questions of pupils tend more often to be verbally approving, and to elicit elaborative comments. There is a slight indication that experience as a teacher's aide or assistant may be positively related to verbally probing and approving behaviors. It might be suggested that a cycle of task-oriented verbal behaviors manifests when teacher-interns actively direct more questions and requests for comments to pupils, combined with supportive verbal praise for their contributions. This cluster is slightly positively related to Cluster 1 (Positive Task-Relevant Teacher-Intern and Pupil Interaction, $r = .19$) and Cluster 9 (Lower Socio-Economic Academic Background, $r = .19$), and negatively related to Cluster 2 (Teacher-Intern Observation and Group Interaction, $r = -.16$) and Cluster 5 (Senior Work-Experienced Teacher-Interns, $r = -.16$). The slight relationship of this dimension to Cluster 1 has been explicated. Positive task-oriented interactions are largely composed of verbal exchanges between teacher-interns and pupils. The negative relationship of this dimension to

Clusters 2 and 5 have also been explicated. Teacher-interns who are verbally probing tend not to engage, under observed conditions, in frequent group interactions, motor movements, nor to monitor students, and are unlikely to be older, married, and to have a long employment record. Relevant to Cluster 5, it appears that teacher-interns with a lower socio-economic and academic background may more often exhibit verbally elicitative, praising behaviors in their interactions with students. The reliability of the cluster is .85.

Cluster 7, Teacher-Interns From Low Income Background.--This cluster, defined by demographic items, is extremely specific. It indicates only that teacher-interns who have lived or worked for any long period of time in a low income area, tend not to have employment experience as a teacher. Those who have lived long in a low income area tend also to have worked longer in such a milieu. This dimension is slightly negatively related to Cluster 2 (Teacher-Intern Observation and Group Interaction, $r = -.19$) and Cluster 10 (White High Academic Achievers, $r = -.18$). The relationship of this dimension to Cluster 2 has been explicated. Teacher-interns with a low income background tend not, under observed conditions, to exhibit great movement in the classroom, nor to monitor students or engage in frequent group interactions. Relevant to Cluster 10, these teacher-interns are unlikely to have either high academic

records, or high scores on the Val-Ed. In addition, they appear not to be white for the most part. The reliability of the cluster is .90.

Cluster 8, Male Veteran Teacher-Interns.--This cluster is defined by demographic variables, and indicates only that more male teacher-interns of Mexican-American ethnicity have served in the military, compared to male white and black subjects in the sample. This dimension is slightly negatively related to Cluster 2 (Teacher-Intern Observation and Group Interaction, r = -.27) and positively related to Cluster 9 (Lower Socio-Economic Academic Background, r = .28) and Cluster 1 (Positive Task-Relevant Teacher-Intern and Pupil Interaction, r = .18). The relationship of this dimension to Clusters 1 and 2 have been explicated. Male veteran Mexican-American teacher-interns tend slightly, under observed conditions, to be associated with more positive, verbally probing task-relevant interaction with individual students, and to seldom engage in group interactions, monitoring of the class, or to exhibit much motor movement. Relevant to Cluster 9, it appears that these subjects tend to have lower academic records, and often come from lower socio-economic backgrounds. They also seem to be less likely to exhibit demonstrative (gestural or nodding) behaviors. The reliability of the cluster is .97.

Cluster 9, Lower Socio-Economic Academic Background.--This cluster is defined by demographic items and indicates that teacher-interns who have lived long in low income areas tend not to have high undergraduate grade point averages, or many credits in Educational courses. They also appear to make less use of the blackboard, and tend to exhibit relatively few gestural expressions or head nods. This dimension is moderately negatively related to Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior, r = -.32) and Cluster 10 (White Academic Achievers, r = -.43), and slightly positively related to Cluster 4 (Positive Teacher-Intern Contact, r = .20), Cluster 6 (Verbally Probing Teacher-Interns, r = .19) and Cluster 8 (Male Veteran Teacher-Interns, r = .28). The relationship of this dimension to Clusters 3, 4, 6, and 8 have been explicated. Overall, teacher-interns from a lower socio-economic background, and with lower academic ranking may more often exhibit approving physical contact in the classroom, and be more verbally probing and praising of students. Under observed conditions, they seldom exhibited disapproving behaviors. Many of these teacher-interns are likely to be Mexican-American males. Relevant to Cluster 10, it appears that these teacher-interns are unlikely to have high academic records, high scores on the Val-Ed., or to be white. The reliability of the cluster is .86.

Cluster 10, White High Academic Achievers.--This cluster is defined by demographic items and indicates that teacher-interns who have high scores on the Val-Ed., an attitudinal measure of personal values and personality, tend also to have high overall undergraduate grade point averages. Most of these teacher-interns are white. This dimension is slightly negatively related to Cluster 7 (Teacher-Interns From Low Income Background, r = -.18) and moderately related to Cluster 9 (Lower Socio-Economic Academic Background, r = -.43). The relationships of this dimension to Clusters 7 and 9 have been explicated. Predominantly white teacher-interns with high academic records, and high scores on the Val-Ed., are unlikely to come from a lower socio-economic background, to have lived long or to have worked in a low income area. The reliability of the cluster is .70.

Overview of Empirical V-Analysis of Behavioral and Demographic Variables

Considering the thrust of the results reported in Table 7 and Table 8, some consistent patterns emerge, and have implications for subsequent analyses.

It is apparent that the behavioral and demographic variables are essentially unrelated empirically. In Clusters 1, 2, 3, 4, and 6, which are the principle clusters attracting the behavioral categories, there is only one

demographic item present. The inverse is also largely true in Clusters 5, 7, 8, 9, and 10 which are almost completely made up of demographic items. Although the correlations between the oblique cluster domains (Table 8) mediate this picture somewhat, the magnitude of these correlations is not great.

It is for these reasons, and to return more closely to the central focus of the research that demographic variables have been excluded from subsequent analyses. This serves to eliminate variance contributed by those marginally relevant items which have yielded no empirically significant patterns of relationship with behavioral categories, failing to contribute to basic understanding of teacher-learner performances in the classroom. To consider the patterns of relationships among the demographic items, carries us beyond the scope of the present study. The essential absence of interface between behavioral and demographic categories thus invites subsequent concentration on the foremost object of interest, analyses of classroom behaviors.

Cluster Analysis of Behavioral Variables

The Clusters and Their Interrelationships

The clusters obtained for the full set of behavioral variables are presented in Table 9. The correlations

Table 9. Empirical V-Analysis of behavioral variables.

Cluster	Loading
1. Positive Task-Relevant Teacher-Intern and Pupil Interaction	
A. Pleasant Probing Teacher-Intern	
(D) 1. Intern is attractive--smiles more (Teacher Attraction:Pleasant/ Unpleasant)	.98
2. Intern often asks pupils to amplify on remarks or comments (Teacher Eliciting Verbal Elaboration)	.47
B. Pupil Pondering	
(D) 1. Student group thinking time (Pupil Verbal Latency:Group)	.99
(D) 2. Individual student thinking time (Pupil Verbal Latency:Individual)	.94
3. Pupil mouthing object (Pupil Mouthing Object)	.42
C. Pupil Responsiveness	
(D) 1. Pupils discuss more (Pupil Discussion of Task)	.95
2. Individual students respond more spontaneoulsy (Pupil Spontaneously Answering Teacher:Individual)	.93
3. Individual pupil answers teacher more often (Pupil Answering Teacher:Individual)	.72
2. Motor Active Group Interaction	
A. Motor Active Teacher-Intern	
(D) 1. Intern moves about classroom (Teacher Locomotion Strength:Stationary)	.98
(D) 2. Intern moves about classroom for short distance (Teacher Locomotion Strength:Small Movement)	.97

Table 9 (Continued)

Cluster		Loading
(D)	3. Intern moves often about classroom (Teacher Locomotion Frequency)	.97
	4. Intern is beyond reach of pupil (Teacher Proximity:Distant)	.64
	5. Intern seldom exhibits long distance movements in classroom (Teacher Locomotion Strength:Large Movement)	.58
	6. Intern is beyond reach of pupil (Teacher Proximity:Close)	.49
	B. Demonstrative Group Interaction	
(D)	1. Intern often gestures emphatically (Teacher Baton Gesture)	.71
	2. Intern seldom interacts with individual (Teacher Interaction:Individual)	.52
	3. Intern often interacts with groups (Teacher Interaction:Group)	.49
	4. Intern seldom uses instructional materials for long period of time (Teacher Usage of Instructional Materials:Duration)	.47
	C. Group Responsiveness	
	1. Pupils answer teacher more often (Pupil Answering Teacher:Group)	.45
3.	Teacher-Interns' Disapproval of Task-Irrelevant Behavior	
	A. Intern Disapproval During Instruction	
(D)	1. Intern speaks disapprovingly to pupil (Teacher Verbalization:Total Disapproving)	.95
(D)	2. Intern speaks disapprovingly to pupil (Teacher Verbalization:Disapproving)	.94
	3. Intern often uses blackboard (Teacher Usage of Blackboard: Occurrences)	.49

Table 9 (Continued)

Cluster	Loading
4. Intern makes prolonged use of blackboard (Teacher Usage of Blackboard:Duration)	.45
5. Intern leans away from pupil in interaction (Teacher Position of Trunk:Backward)	.41
B. Pupil Misbehavior	
(D) 1. Pupil makes unnecessary noise (Pupil Noisemaking Activity)	.88
(D) 2. Pupil emits nonverbal vocal noise (Pupil Paralingualism)	.80
3. Pupil moves about in seat or wanders around room (Pupil Gross Motor Activity)	.75
4. Positive Teacher-Intern Contact	
A. Intern's Approving Contact	
(D) 1. Intern approvingly touches pupil (Teacher Physical Contact:Approving)	.99
(D) 2. Intern approvingly touches pupil for prolonged periods (Teacher Physical Contact:Approving-Duration)	.80
5. Teacher-Interns' Physical Position	
A. Standing Instructional Teacher-Intern	
(D) 1. Intern seldom leans forward (Teacher Position of Trunk:Forward)	.93
(D) 2. Intern more often is erect (Teacher Position of Trunk:Erect)	.91
3. Intern stands upright (Teacher Gross Posture)	.52
(D) 4. Intern often gestures emphatically (Teacher Baton Gesture)	.26
(D) 5. Intern often stands still (Teacher Locomotion Strength:Stationary)	.15

Table 9 (Continued)

Cluster	Loading
6. Teacher-Interns' Facial Expression	
A. Approving Expression	
(D) 1. Intern smiles for prolonged periods (Teacher Smile:Duration)	.99
(D) 2. Intern often smiles (Teacher Smile:Nondirectional)	.93
7. Teacher-Interns' Gaze Direction	
A. Monitoring Pupil	
(D) 1. Intern often looks toward pupil (Teacher Gaze Direction:Pupil)	.99
(D) 2. Intern seldom looks away from pupil (Teacher Gaze Direction:Other)	.99
8. Pupil Task-Irrelevant Activity	
A. Pupil's Nontask-Attending Behavior	
(D) 1. Pupil talks out inappropriately with peers (Pupil Eliciting Peer Verbalization)	.89
(D) 2. Pupil talks about task-irrelevant matters (Pupil Task-Irrelevant Verbalization)	.74
3. Pupil approvingly touches another person (Pupil Physical Contact:Positive)	.63
(D) 4. Pupil negatively touches another person (Pupil Physical Contact:Negative)	.50

Table 9 (Continued)

Cluster	Loading
9. Teacher-Interns' Disapproval	
A. Disapproval During Instructional Period	
(D) 1. Intern disapprovingly touches pupil (Teacher Physical Contact:Disapproving)	.86
(D) 2. Intern Frowns at Pupil (Teacher Frown)	.75
3. Undetermined intern interaction (Teacher Interaction:Undetermined)	.54
4. Intern often uses instructional material (Teacher Usage of Instructional Material:Occurrences)	.45
B. Nonattending Pupil	
(D) 1. Pupil looks away from teacher or work-materials during instructional period (Pupil Gaze Direction:Other)	.45

NOTE: (D) denotes a definer item for the cluster.

between oblique cluster domains (correlations between the rotated oblique factors) are presented in Table 10.

Description and Interpretation of the Clusters

The following is a descriptive summary of the conceptual themes represented by each of the nine cluster domains. Within each cluster variables have been grouped in terms of more coherent conceptual sub-categories.

Cluster 1, Positive Task-Relevant Teacher-Intern and Pupil Interaction.--This cluster is defined by variables reflecting pleasant, task-oriented teacher-intern and pupil interactions, primarily with individual students. Teacher-interns' facial attraction appears largely to reflect a pleasant facial expression, which may function as a cue supportive of appropriate classroom behaviors, and when combined with verbal probing, may promote enthusiastic verbal responsiveness by pupils. Pupils' verbal response latency might be conceptualized as a cognitive factor indicative of "thinking time." It appears overall that pupils' enthusiastic, task-related verbal behaviors tend to be related to teacher-interns' nonverbally pleasant, positive disposition toward pupils in general. Clearly, this is a highly verbal, time-on-task cluster with regard to pupils, which is strongly associated with nonverbally supportive or pleasant behavior by teacher-interns

Table 10. Correlations between oblique cluster domains for the empirical clusters.

Clusters	1	2	3	4	5	6	7	8	9
1. Positive Task-Relevant Teacher-Intern and Pupil Interaction	--	.07	-.06	-.11	.10	.52	.07	-.13	-.06
2. Motor Active and Group Interaction	.07	--	-.02	.11	-.01	.05	.53	-.21	-.11
3. Teacher-Interns' Disapproval of Task-Irrelevant Behavior	-.06	-.02	--	-.09	.24	-.16	.08	.51	.50
4. Positive Teacher-Intern Contact	-.11	.11	-.09	--	-.23	.01	.13	-.05	-.00
5. Teacher-Interns' Physical Position	.10	-.01	.24	-.23	--	.09	.22	.13	.24
6. Teacher-Interns' Facial Expression	.52	.05	-.16	.01	.09	--	.03	-.08	-.09
7. Teacher-Interns' Gaze Direction	.07	.53	.08	.13	.22	.03	--	-.04	.21
8. Pupil Task-Irrelevant Activity	-.13	-.21	.51	-.05	.13	-.08	-.04	--	.32
9. Teacher-Interns' Disapproval	-.06	-.11	.50	-.00	.24	-.09	.21	.32	--

combined with frequent probes and requests for pupil comments and remarks. The cluster tends to be notably positively related to Cluster 6 (Teacher-Interns' Facial Expression, r = .52). This suggests that teacher-interns' rated facial attraction is largely related to frequency and duration of smiling by subject. The more smiles exhibited by teacher-interns and the longer their duration, the more "attractive" they tend to be perceived by raters. It might also be suggested that "attractiveness", particularly defined by smiling, may be importantly related as a non-verbal cue, to approval and emotional supportiveness in the classroom. The cluster has a reliability of .99.

Cluster 2, Motor Active Group Interaction.--This cluster is defined by variables reflecting teacher-interns' gross movements in the classroom. The pattern of correlations indicate that teacher-interns' movements tend to be small (less than seven consecutive steps) and frequent, often accompanied by demonstrative gestural expressions in group interactions. In these group interactions verbal responsiveness by pupils, in form of answering teacher, is high in terms of group rather than individual behavior. Under these conditions it is quite unlikely that the teacher-intern makes use of instructional materials for any long period of time. Overall it appears that the teacher-intern tends to approach groups (rather than an individual) and

engage in verbal exchanges with two or more pupils. The cluster is notably positively related to Cluster 7 (Teacher-Interns' Gaze Direction, r = .53) and slightly negatively related to Cluster 8 (Pupil Task-Irrelevant Activity, r = -.21). Apparently, teacher-interns are likely to more often look toward pupils when they move about the classroom (possibly seeking to approach or monitor specific targets) and engage in verbal group encounters. In addition, it appears to be unlikely that pupils exhibit task-irrelevant verbal or nonverbal behaviors under these conditions. This would not be unexpected if pupils were aware that they were being observed by teacher, as a group, or were interacting with him. The cluster has a reliability of .97.

Cluster 3, Teacher-Intern Disapproval of Task-Irrelevant Behavior.--This cluster is defined by variables reflecting teacher-interns' primarily verbal disapproval of noisy pupils. Task-irrelevant motor movements (wandering around the room, moving about in seat) and vocal and nonverbal noisemaking activities tend to be associated with more critical, "punishing" remarks by teacher-interns. A further expression of disapproval is exhibited by teacher-interns leaning away from misbehaving pupils. It appears that pupils' task-irrelevant nonverbal behaviors and teacher-interns' negative comments often manifest when teacher-interns use the blackboard more often, and for longer periods of time. Possibly frequent and longer

periods of instructional activity which does not directly involve the active participation of pupils promotes their non-attending misbehaviors, or restlessness. This may be an especially notable factor in the early primary grades, where many of the observations were conducted. The cluster is notably positively related to Cluster 8 (Pupil Task-Irrelevant Activity, $r = .51$), Cluster 9 (Teacher-Intern Disapproval, $r = .50$) and slightly related to Cluster 5 (Teacher-Interns' Physical Position, $r = .24$); it is slightly related to Cluster 6 (Teacher-Interns' Facial Expression, $r = .16$). In terms of their facial expression, it is not unexpected that teacher-interns would tend not to exhibit smiles, approving of time-off-task behaviors by pupils. An approving facial expression (smiling) appears to be dichotomous from verbal and nonverbal cues of disapproval, and to be an unlikely event in the face of inappropriate classroom behaviors. Conversely, it is conceptually consistent that a variety of pupils' task-irrelevant activities during an instructional period would be associated with verbal and nonverbal communications of disapproval and criticism by teacher, as suggested by Cluster 8. Similarly, Cluster 9 indicates that other forms of disapproval, frowns and negative physical contacts, are more likely to occur when pupils emit undesired classroom responses, especially of a noisemaking variety. Finally, it is suggested by Cluster 5

that teacher-interns' disapproval tends to be associated with their standing still, erect, and being gesturally active, as might occur during an instructional period. The cluster has a reliability of .95.

Cluster 4, Positive Teacher-Intern Contact.--This doublet cluster reflects only approving physical contact by teacher-interns. It seems that frequency and length of approving contact are strongly related. The more often approving contact occurs, the longer each episode will last. The cluster is slightly negatively related to Cluster 5 (Teacher-Irterns' Physical Position, $r = -.23$). It is unlikely that teacher-interns will stand still and erect when approvingly touching another person. The cluster has a reliability of .91.

Cluster 5, Teacher-Interns' Physical Position.--This cluster is defined by variables reflecting teacher-interns' physical position in the classroom. It indicates only that teacher-interns standing posture tends to be erect, stationary, and often accompanied by demonstrative gestural expressions. The cluster tends to be slightly positively related to Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior, $r = .24$), Cluster 7 (Teacher-Interns' Gaze Direction, $r = .22$), and Cluster 9 (Teacher-Intern Dis-Approval, $r = .24$); it is slightly negatively related to Cluster 4 (Positive Teacher-Intern Contact, $r = -.23$). As previously indicated teacher-interns more often exhibit

disapproval when they are erect and stationary; critical comments, frowns, and negative contact is more likely to occur when subject assumes an erect, fixed posture. In regard to Cluster 7, teacher-interns appear more often to look toward pupils while standing still and erect, and Cluster 4 discloses that positive contacts are quite unlikely to manifest under such conditions. The reliability of the cluster is .89.

Cluster 6, Teacher-Interns' Facial Expression.--This doublet cluster reflects only teacher-interns' approving facial expression in form of smiling. More frequent smiles tend to be associated with smiles of longer duration. The cluster is notably positively related to Cluster 1 (Positive Task-Relevant Teacher-Intern and Pupil Interaction, $r = .52$) and slightly negatively related to Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior, $r = -.16$). As previously indicated, smiles are strongly associated with verbally probing, task-oriented teacher-intern and pupil interactions, primarily with individual students. Pupils tend to more enthusiastically participate in frequent exchanges with teacher-interns under conditions in which the teacher-intern combines requests for elaborative comments with supportive, approving cues for the desired behaviors. Consonantly, teacher-interns' disapproval is unlikely to manifest to the extent that pupils are exhibiting

time-on-task responses during an instructional period. The cluster has a reliability of .97.

Cluster 7, Teacher-Interns' Gaze Direction.--This doublet cluster reflects only direction of gaze by teacher-interns, who most often look toward pupils. The cluster is notably positively related to Cluster 2 (Motor Active Group Interaction, r = .53), and slightly related to Cluster 5 (Teacher-Interns' Physical Position, r = .22) and Cluster 9 (Teacher-Intern Disapproval, r = .21). As previously indicated, teacher-interns' frequent gaze toward pupils tends to be associated with verbally active group interactions and standing still and erect. In regard to Cluster 9, it appears that more disapproving nonverbal behaviors (frowns and negative contact) manifest with frequent gaze toward pupils. The cluster has a reliability of .99.

Cluster 8, Pupil Task-Irrelevant Activity.--This cluster describes a complex of time-off-task pupil behaviors. Talking out of turn with peers during an instructional period, and talking about task-irrelevant matters tends to be associated with more task-irrelevant physical contact behaviors in the classroom. Talking out of turn to peers may represent an inappropriate behavior which leads to more inappropriate behaviors, generating a cycle of time-off-task responses. The cluster is notably positively related to Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior, r = .51) and moderately related to Cluster 9

(Teacher-Intern Disapproval, r = .32); it is slightly negatively related to Cluster 2 (Motor Active Group Interaction, r = -.21). As previously indicated, a variety of verbal and nonverbal task-irrelevant pupil behaviors are highly associated with more frequent verbal and nonverbal disapproval by teacher-interns; this is especially the case when teacher-interns' make frequent and prolonged use of the blackboard. Teacher-interns seem to be much less likely to exhibit disapproval in their primarily verbal interactions with groups of students. In regard to Cluster 9, this theme is reinforced. Increments in non-attending pupil behavior during an instructional period is associated with increments in disapproving physical contacts by teacher-interns, along with a negative frowning expression. Consonant with the observation that pupils tend to "misbehave" or exhibit task-irrelevant behaviors with more frequent and longer use of the blackboard by teacher-interns, Cluster 9 discloses that pupils tend more often to look away from teacher or teacher-designated stimulus with more frequent use of instructional materials. Clearly, it seems that prolonged and/or frequent usage of materials or the blackboard as instructional media may be counterproductive in terms of maintaining attentive, task-oriented responses by pupils. This, to the extent that pupils are not actively engaged in the instructional activity. The cluster has a reliability of .79.

Cluster 9, Teacher-Intern Disapproval.--This cluster is defined by variables reflecting disapproving nonverbal behaviors by teacher-interns. More disapproving physical contact is associated with more frowning expressions, which are related to non-attending behaviors by pupils in the form of looking away from the teacher or teacher-designated stimulus during an instructional period. These behaviors are likely to manifest with more frequent use of instructional materials. The cluster is notably positively related to Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior, $r = .50$), and slightly related to Cluster 5 (Teacher-Interns' Physical Position, $r = .24$), Cluster 7 (Teacher-Interns' Gaze Direction, $r = .21$), and moderately related to Cluster 8 (Pupil Task-Irrelevant Activity, $r = .32$). As previously indicated, teacher-interns' verbal and nonverbal expressions of disapproval strongly relate to frequent task-irrelevant, non-attending pupil responses during an instructional period, which is likely to involve frequent and/or long usage of instructional aids such as the blackboard or materials. Disapproval seems to be associated with teacher-interns' standing still and erect, monitoring groups of pupils. The cluster has a reliability of .80.

Overview of Empirical V-Analysis of Behavioral Variables: Guidelines for the Preset Analysis

In considering these clusters it is apparent that they are similar in form and pattern to those making up the behavioral clusters identified in the Empirical V-Analysis of Behavioral and Demographic Variables. However, it is also apparent that an improvement of the clusters, via condensation and elimination, would be desirable from the standpoint of both conceptual clarity and statistical respectability.

A preset key-cluster analysis was conducted in order to refine and further clarify the discrete structure of those clusters which were most reliable, conceptually coherent, and which accounted for the greatest amount of variance. In presetting the number of dimensions or revising the definers of one or more dimensions, the following specific objectives were identified:

1. Maximize the collinearity of the definers of each dimension;

2. Increase the degree of independence of the clusters from each other;

3. Attempt to create in each cluster a conceptually coherent construct describing aspects of teacher-pupil interactions;

4. Maximize reliability of the cluster score;

5. Contribute to the generality of each cluster and the variables that define it.

The result should yield reliable, salient, discretely generalizable dimensions identifying essential elements of teachers' classroom behaviors.

In attempting to achieve these objectives and increase the reliability of the clusters, the following rules applied for the preset analysis:

1. Doublet clusters were eliminated, unless they were of profound conceptual interest;

2. Clusters with low reliability ($r = < .95$) were eliminated;

3. Clusters were eliminated which had a high correlation with other, more reliable and more conceptually coherent clusters;

4. Requirements of an O-Analysis dictate that a relatively few number of clusters is desirable, thus demanding a conservative approach to the total number of clusters retained.

These rules were specifically applied to the clusters obtained in the preset analysis as follows:

Cluster 1 (Positive Task-Relevant Teacher-Intern and Pupil Interaction), Cluster 2 (Motor Active Group Interaction) and Cluster 3 (Teacher-Intern Disapproval of Task-Irrelevant Behavior) emerging from the Empirical V-Analysis

of Behavioral Variables were retained for the preset analysis. These clusters were highly reliable r = > .95), conceptually coherent dimensions embracing a number of teacher-intern and pupil variables describing aspects of classroom interactions. In addition, these clusters were comparatively discrete from the other dimensions, and were relatively generalizable. Only definer items in those clusters which had a correlation between oblique cluster domains greater than +.5 to either Cluster 1, 2, or 3 were included in the relevant cluster for further analysis. The other less reliable domains were deleted from the preset analysis. The following summary identifies those clusters from which key definer items were included in one of the above domains, and indicates the rationale for the selection:

Cluster 4 (Positive Teacher-Intern Contact), a doublet, was largely unrelated to any cluster domain; the definers (Teacher Physical Contact: Approving, and Teacher Physical Contact: Approving--Duration) were not included for the preset analysis.

Cluster 5 (Teacher-Interns' Physical Position) was relatively specific and largely unrelated to any other domain. Two of the definer items in this cluster were unacceptably low (Teacher Baton Gesture, r = .26, and Teacher Locomotion Strength: Stationary, r = .15). These and the other definers (Teacher Position of Trunk: Forward,

and Teacher Position of Trunk: Erect) were deleted from subsequent analysis.

Cluster 6 (Teacher-Interns' Facial Expression), a doublet, contained reliable definers (Teacher Smile: Duration, r = .99, and Teacher Smile: Non-directional, r = .93) which were notably related (r = .52) to Cluster 1. These two definers were therefore included in that cluster for the preset analysis.

Cluster 7 (Teacher-Interns' Gaze Direction), a doublet, reliable definers (Teacher Gaze Direction: Pupil, r = .99, and Teacher Gaze Direction: Other, r = .99) which were notably related (r = .53) to Cluster 2. These two definers were therefore included in that cluster for the preset analysis.

Cluster 8 (Pupil Task-Irrelevant Activity), an extremely specific dimension in which the definer items had relatively low reliability (Pupil Eliciting Peer Verbalization, r = .89, Pupil Task-Irrelevant Verbalization, r = .74, and Pupil Physical Contact: Negative, r = .50) was notably related (r = .51) to Cluster 3. Therefore, the definer having the highest reliability in Cluster 8 (Pupil Eliciting Peer Verbalization) was selected to be included in Cluster 3 for the preset analysis. The remaining definer items were not used in the preset analysis.

Cluster 9 (Teacher-Intern Disapproval), in which the definer items had relatively low reliability (Teacher

Physical Contact: Disapproving, r = .86, Teacher Frown, r = .75 and Pupil Gaze Direction: Other, r = .45) was notably related (r = .50) to Cluster 3. Therefore, the definer having the highest reliability in Cluster 9 (Teacher Physical Contact: Disapproving) was selected to be included in Cluster 3 for the preset analysis. The remaining definer items were not used in the preset analysis.

Preset Key-Cluster Analysis of Behavioral Variables

The Clusters and Their Interrelationships

The clusters for the behavioral variables resulting from the preset key-cluster analysis are presented in Table 11. The correlations between the oblique cluster domains (correlations between the rotated oblique factors) are presented in Table 12.

Description and Interpretation of the Clusters

The following is a descriptive summary of the conceptual themes represented by each of the three cluster domains. Within each cluster variables have been grouped in terms of more coherent conceptual sub-categories.

Cluster 1, Positive Task-Relevant Teacher-Intern and Pupil Interaction.--This cluster is defined by variables reflecting pleasant, task-oriented teacher-intern and pupil

Table 11. Preset key-cluster analysis of behavioral variables.

Cluster	Loading
1. Positive Task-Relevant Teacher-Intern and Pupil Interaction	
A. Pleasant Probing Teacher-Intern	
(D) 1. Intern is attractive (judgment) (Teacher Attraction:Pleasant/ Unpleasant)	.99
2. Intern smiles more often (Teacher Smile:nondirectional)	.60
(D) 3. Intern smiles longer (Teacher Smile:Duration)	.58
4. Intern often asks pupils to amplify on remarks or comments (Teacher Eliciting Verbal Elaboration)	.49
B. Pupil Pondering	
(D) 1. Student group thinking time (Pupil Verbal Latency:Group)	.99
(D) 2. Individual student thinking time (Pupil Verbal Latency:Individual)	.92
3. Pupil Mouthing Object	.42
C. Pupil Responsiveness	
(D) 1. Pupils discuss more (Pupil Discussion of Task)	.98
2. Individual students respond more spontaneously (Pupil Spontaneously Answering Teacher:Individual)	.92
3. Individual pupil answers teacher more often (Pupil Answering Teacher:Individual)	.72

Table 11 (Continued)

Cluster	Loading
2. Observation and Group Interaction	
A. Motor Active Teacher-Intern	
(D) 1. Intern moves about classroom (Teacher Locomotion Strength:Stationary)	.97
(D) 2. Intern moves often about classroom (Teacher Locomotion Frequency)	.96
(D) 3. Intern moves about classroom for short distance (Teacher Locomotion Setrength:Small Movement)	.96
4. Intern is beyond reach of pupil (Teacher Proximity:Distant)	.66
5. Intern seldom exhibits long distance movements in classroom (Teacher Locomotion Strength:Large Movement)	.59
6. Intern is beyond reach of pupil (Teacher Proximity:Close)	.49
B. Observation/Group Interaction	
(D) 1. Intern seldom looks away from pupil (Teacher Gaze Direction:Other)	.71
(D) 2. Intern often gestures emphatically (Teacher Baton Gesture)	.70
(D) 3. Intern often looks toward pupil (Teacher Gaze Direction:Pupil)	.55
4. Intern seldom interacts with individual (Teacher Interaction:Individual)	.55
5. Intern often interacts with groups (Teacher Interaction:Group)	.52
6. Intern seldom uses instructional materials for long period of time (Teacher Usage of Instructional Materials:Duration)	.48
C. Group Responsiveness	

Table 11 (Continued)

Cluster	Loading
1. Pupils answer teacher more often (Pupil Answering Teacher:Group)	.46
3. Teacher-Intern Disapproval	
A. Intern Disapproval During Instruction	
(D) 1. Intern speaks disapprovingly to pupil (Teacher Verbalization:Total Disapproving)	.98
(D) 2. Intern speaks disapprovingly to pupil (Teacher Verbalization:Disapproving)	.94
(D) 3. Intern disapprovingly touches pupil (Teacher Physical Contact: Disapproving)	.51
4. Intern often uses blackboard (Teacher Usage of Blackboard: Occurrences)	.46
5. Intern leans away from pupil in interaction (Teacher Position of Trunk:Backward)	.45
B. Pupil Misbehavior	
(D) 1. Pupil makes unnecessary noise (Pupil Noisemaking Activity)	.88
(D) 2. Pupil emits nonverbal vocal noise (Pupil Paralingualism)	.75
3. Pupil moves about in seat or wanders around room (Pupil Gross Motor Activity)	.75
(D) 4. Pupil talks out inappropriately to peers (Pupil Eliciting Peer Verbalization)	.70
5. Pupil approvingly touches another person (Pupil Physical Contact:Positive)	.60

NOTE: (D) denotes a definer item for the cluster.

Table 12. Correlations between oblique cluster domains for the present key-cluster analysis.

Cluster	1	2	3
1. Task-Relevant Teacher-Intern and Pupil Interaction	--	.07	-.10
2. Observation and Group/Interaction	.07	--	-.01
3. Teacher-Intern Disapproval	-.10	-.01	--

interactions, primarily with individual students. It represents a cluster in which pupils are highly verbally active on task-oriented themes introduced and/or promoted by a nonverbally supportive teacher-intern who elicits verbal responses. Teacher-interns' facial attraction appears largely to reflect a pleasant facial expression in the form of smiles, which seems to function as a cue supportive of appropriate classroom behaviors, and when combined with verbal probing or questioning, may promote enthusiastic verbal responsiveness and "thinking" by pupils. More frequent and longer smiles tend to be related to more enthusiastic verbal participation by students. Pupils' verbal response latency might be conceptualized as a cognitive factor indicative of "thinking time." It seems to be clearly apparent that a nonverbally approving behavior in the form of smiling by teacher-interns' related to probing requests of pupils to amplify or elaborate on their own or others comments, is strongly associated with time-on-task verbal participation which is often spontaneous, and may in turn promote continuation of positive interactions. The cluster is unrelated to other dimensions. The reliability of the cluster is .96.

Cluster 2, Observation and Group Interaction.--This cluster is defined by variables reflecting teachers' gross movements in the classroom. The pattern of correlations indicate that teachers movements tend to be small (less

than seven consecutive steps) and frequent, often accompanied by demonstrative gestural expressions in group interactions. In these group interactions verbal responsiveness by pupils is high in terms of group rather than individual behavior. Under these conditions it is quite unlikely that teacher makes use of instructional materials for any long period of time. Teachers exhibiting this motor active pattern of behavior are likely to look toward pupils, possibly monitoring group or class behaviors, as during an instructional or lecture period. Overall it appears that the teacher tends to approach groups of pupils and engage in verbal exchanges with two or more students. The cluster is not distinguished by variables reflecting any extreme emotional tone, either in form of positive or negative interaction. The cluster is unrelated to other dimensions. The reliability of the cluster is .93.

Cluster 3, Teacher-Intern Disapproval.--This cluster is defined by variables reflecting teacher-interns' verbal and nonverbal disapproval of non-attending, noisey pupils. Task-irrelevant motor movements (wandering around the room, moving about in seat) and vocal and nonverbal noisemaking activities, along with talking out of turn to peers, tend to be associated with more critical, "punishing" remarks by teacher-interns. They are also more likely to express their disapproval by leaning away from misbehaving pupils, and to exhibit negative contact. The most frequent form

of pupil misbehavior appears to be noisemaking activities (moving objects around, kicking objects, scrapping or tapping items, throwing materials) followed by vocal noisemaking and talking out to peers during an instructional period. It appears that pupils' task-irrelevant behaviors and teacher-interns' disapproval often manifest when teacher-interns use the blackboard frequently. As has been previously suggested, possibly frequent periods of instructional activity (e.g., using the blackboard) which does not directly involve the active participation of students, serves to promote their non-attending behaviors. The cluster is unrelated to other dimensions. The cluster has a reliability of .92.

Overview of the Preset Key-Cluster Analysis: Dimensions for O-Analysis

The three key clusters emerging from the preset analysis represent highly reliable, independent, and generalizable dimensions describing aspects of teacher-interns' classroom behaviors. These clusters were submitted to an O-Analysis to identify unique or common patterns of profile scores distinguishing conceptually coherent typologies for teacher-interns. Specifically, to determine if the individuals in this multidimensional study are unique on the behavioral variables examined (that is, on the cluster scores derived from them by the preset V-Analysis), an O-Analysis was conducted. This analysis discloses whether

the aggregate of behavioral patterns for teacher-interns are undifferentiated, or fall into discrete groups or types possibly indicating that particular patterns of behavior are generated with high frequency by, for example, social factors. The objective of O-Analysis is essentially to reduce a large number of individuals into a smaller number of collinear and salient subgroups (O-Clusters) distinguished from each other by their patterns of scores on the attributes examined (Tyron and Bailey, 1970).

O-Analysis

An O-Analysis on the clusters generated by the preset analysis yielded three distinct, though relatively trivial, typologies for teacher-interns in the sample. Table 13 reports the O-Type means for the three preset clusters. Table 14 presents the overall homogeneity across all dimensions given for each O-Type, and indicates that the three types are distinct from each other.

O-Type 1 (Approving Teacher-Interns) describes a type of teacher-intern oriented more toward pleasant, verbally active task-relevant interactions (primarily with individuals) than with disapproval or observation and group interactions. Approving teachers may possibly represent an affectively active, demonstrative group of individual-interns who stand somewhat apart from the more emotionally inhibited (non-demonstrative) teacher-interns. However, it should also be pointed out that this O-Type was not distinctive in that thirty-four (34) subjects (out of forty-three) were assigned to this category.

Table 13. O-types for the three preset key-clusters of behavioral variables.

O-Type	Cluster		
	Positive Task-Relevant Teacher-Intern and Pupil Interaction 1	Observation and Group Interaction 2	Teacher Intern Disapproval 3
1. Approving Teacher-Intern*	High 48.67	Low 46.42	Medium 47.35
2. Disapproving Teacher-Intern**	Medium 48.30	Low 46.82	High 81.46
3. Observing/Group Interactional Teacher-Intern	Low 47.52	High 74.81	Medium 50.37

*n=34 **n=5 ***n=3

Table 14. Overall homogeneity across the three dimensions (factor scores) given for each of the three O-types.

O-Type	Homogeneity
1. Approving Teacher-Intern	.92
2. Disapproving Teacher-Intern	.92
3. Observing Group/ Interactional Teacher-Intern	.87

This may represent, in a sense, modal effective teaching behavior by teacher-interns.

O-Type 2 (Disapproving Teacher-Interns) is clearly less likely to be associated with pleasant, task-relevant interactions or with observation and group interactions. Overwhelmingly this teacher-intern type is the stereotypical classroom "policeman." Disapproval tends to be distinct as a dimension and type in that the n of this O-Type is five (5).

O-Type 3 (Observing/Group Interactional Teacher-Interns) tends to have little association with pleasant, task-relevant interactions. This type appears to have some greater relationship to teacher disapproval as a dimension. As previously suggested, this type may possibly represent a group of teacher-interns who are less free in their display of affectivity in the classroom. The amalgam is of monitoring and formally teaching the class as a group. Three (3) subjects were assigned to this type.

These results are consistent with the findings reported earlier on the independent preset clusters distinguishing between Positive Task-Relevant Teacher-Intern and Pupil Interaction, Observation and Group Interaction, and Teacher-Intern Disapproval.

Hypothesis-Testing Variables

It will be recalled that a generic hypothesis predicted positive correlations among several approving verbal and nonverbal teacher-intern behaviors and task-relevant learner behaviors. The results of the cluster analysis indicate that

only teacher-interns' smiles emerged as an approving nonverbal variable correlated with increments in pupils' task-oriented responsiveness (answering teacher and discussing task-relevant topics). This finding is consistent with the hypothesis to the extent that it defined a highly collinear and independent domain composed of several pupil items exclusively reflecting task-relevant (verbal) behaviors.

However, correlations among the other variables describing aspects of teacher-interns approving behaviors (e.g., approving comments, positive contact, head and body orientation) failed to emerge in the clusters as expected. Therefore, the generic hypothesis is only partially confirmed by the data.

In summary, a major finding of this research suggests that a nonverbal behavior by teacher-interns in the form of smiling (here assumed to convey approval and possibly promote or support behaviors with which it is temporally associated), is more significantly related to increments in desirable classroom performance by students, under a given set of conditions, than is verbal praise or other signs of approval. With the caveat in mind that causal relationships cannot be determined from correlational data, it might be opined that smiles or a pleasant facial expression, can speak more loudly than words in terms of affecting primarily verbal behaviors under the observed conditions in the learning environment.

CHAPTER IV

DISCUSSION

Schedules of Observation

The results of the present experiment failed to demonstrate that variable and fixed interval schedules of observations differentially affect verbal and nonverbal responses by teacher-interns in the classroom. Only one of the thirty-eight variables examined reached an acceptable level of statistical significance (see Table 5, Locomotion Strength: Small Movement, $t = 3.21$, $p < .05$). In terms of procedures for evaluating the significance of such a series of statistical tests (see Sakoda et al., 1954), these results are not supportive of an experimental effect and it is therefore concluded that the hypothesis predicting significant differential effects between treatment groups is not supported by the data.

In interpreting this finding, two observations are readily apparent: (1) Any potential effects videotape observations may have had on the behaviors of the observed could have been nullified by a saturation effect, that is, exposure of the problematic stimulus to a point where it no longer evokes measurable behavioral changes. It will be

recalled that the subjects were exposed to a pre-experimental adaptation period during which they were videotaped in the natural setting on several occasions. The subjects may simply have become inured to the intrusion of the observation variable into their environment, a result which would be consistent with that reported by Carus (1970) who found that teachers ignored videotaped observations of their classroom performance. (2) It has been well documented that various schedules on which reinforcement is delivered can be discriminated and can strongly influence behavior by the recipient organism (Ferster and Skinner, 1957). The individual's awareness of environmental contingencies (the necessary conditions under which reinforcement is delivered), combined with incentive-related variables, can exert significant influence over behavior.

In the present research neither the schedule of observation nor the videotape observation variable itself appear to have functioned as discriminative stimuli, setting the occasion for particular patterns of response. These factors were not associated with any effective reinforcing (or aversive) stimuli. The variables apparently had no reinforcing value to subjects in themselves. Having established no contingent link between the observation schedule (or observation) and the delivery of incentive stimuli (planned or randomly occuring), it is not surprising that observed subjects may be largely indifferent to the observations. The

variables represent contextually neutral stimuli. This assertion is lent some support by Spielberger, Berger, and Howard's (1963) study of the reinforcing properties of feedback events evaluated by subjects, disclosing that subjects who were aware of the response-reinforcement contingency, and who prized reinforcers, exhibited gains in criterion behaviors. Those aware subjects who were indifferent to, or were irritated by, the reinforcing stimulus tended not to exhibit notable changes in criterion behaviors. Overall, incentives that are weak, delayed, or inconsistently applied, as often happens in the natural setting, are found to generate little or no modification in the behavior of subjects exposed to such conditions. This implies that if observations are to exert stable operant effects on the behaviors of the observed, they must be programmatically associated with effective reinforcing events.

Utility of the Behavior Rating Schedule

The Behavior Rating Schedule developed for this research appears to have served adequately as an operationally explicit and replicable measurement instrument for categorized verbal and nonverbal behaviors in the classroom setting. The cluster analyses identified some duplicative categories which may be eliminated in future adaptation of the instrument. The analyses also pointed up the importance of including additional categories measuring discrete

dimensions of teacher-learner behaviors. Items should be included to assess *content-related* areas of speech, including "opinion," "factual," "interpretative," "organizing," or "personal reference" statement. Measures should also be obtained of teacher leadership skills, enthusiasm or spontaneity, classroom control, acceptance/rejection of student contributions, and attempts to engender student participation, as well as indices of teacher-pupil, teacher-group, and intra-group cohesion. It could also prove useful to include measures of speech disfluencies (patterns of hesitations and disturbances) to serve as indicants of emotionality and processes of linguistic encoding. Analyses of tones of voice and speed of utterance may also be considered as possible indicants of emotionality by interactants. Certainly the pupil categories should be refined and expanded to include direct measures of behavioral, socio-emotional, and cognitive performances which may be used to determine effects of teacher behavior, and teacher effectiveness in specific dimensions of classroom teaching. Further, it would be especially relevant, operating within a reinforcement-feedback paradign, to examine the form and effects of pupil reinforcement upon teacher behaviors, as such phenomena influence events in the learning environment.

Consideration of the Generic Hypothesis

The generic hypothesis predicting significant positive relationships among verbal and nonverbal approving responses by teacher-interns and task-oriented performance by pupils is only partially confirmed by the present data. The results of the cluster analyses, when considered in terms of the initial hypothesis, indicate that categorized approving teacher-interns' behaviors tend not to be systematically or strongly associated with time-on-task pupil performances. The results of the cluster analysès reveal that teacher-interns' facial expression in form of smiling emerges as a defining variable in a highly collinear and independent dimension describing pupils' exclusively (verbal) task-relevant behaviors. This result is consistent with the predicted relationship, and is taken as partial confirmation of the generic hypothesis. Interestingly, verbal communications of approval, more frequent than smiles, unexpectedly showed no relationship to pupil responsiveness. These results are consistent with Rosenfeld's (1967) finding which indicated that as a medium of affective or attitudinal communication, facial expressiveness (smiles) exerted stronger effects than vocal cues in two-channel communications. Whether intended to elicit reciprocal signs of approval, convey passive satisfaction, or contingently delivered following the emission of critical behaviors, facial expressiveness--smiles--may possibly influence the

future probabilities of a variety of pupil's task-oriented responses. Facial expressiveness may also have notable implications for affecting the probabilities of pro-social verbal classroom behaviors. Interestingly, approving comments were emitted by teacher-interns four times as often as smiles (see Table 5). Without exception, nonverbal signs of approval were less likely than their verbal counterparts to be emitted by teacher-interns. The prevailing task-relevant pupil response was looking toward teacher (or designated stimulus) and to a lesser degree, answering questions. Despite their more infrequent occurrence, it is apparent that certain nonverbal cues, particularly those conveyed by facial expression, are more importantly related to outcome behaviors than are many forms of verbally or vocally delivered communications.

These results of the cluster analyses indicating that smiles and task-relevant pupil behaviors were related, is consistent with studies which have demonstrated a contingent relationship between teachers' nonverbal approval and improvement in task-related verbal and nonverbal pupil responses (Madsen et al., 1968; O'Leary and O'Leary, 1972; Ramp and Hopkins, 1971). However, because of the correlational nature of the preset data, the temporal relationship between teacher-interns' smiles and positive pupil responses cannot be determined. The data allow only for statements about associative interactions among variables. An obvious

question arises however; Are teacher-interns in any way contingently delivering their nonverbal approval consequent to the emission of appropriate pupil performances, possibly strengthening the latter behavior? If smiles are unsystematically (or non-contingently) delivered, then variations in the form and rate of emitted occurrences of pupil responses which they follow, may be expected. Another central question concerns the extent to which pupil responses may function (contingently or non-contingently) as reinforcing stimuli which may promote certain teacher behaviors. Those pupil behaviors which may function as reinforcers (or aversive stimuli) for teacher (or pupil) responses, may be expected to have implications affecting the efficiency and effectiveness of the educational setting. The bi-directional or reciprocal effects of reinforcing events postulated to interact between teacher and pupils merits examination.

Other Related Results

In addition to the results yielded by the cluster analyses which relates teacher-interns observational and approving and disapproving behaviors to pupil performances, analyses of correlational trends among several of the clustered variables disclose interesting findings. For example, in addition to the relationship between smiling

and task-relevant student behavior, two other interesting types of variables emerged in the Positive Task-Relevant Teacher-Intern and Pupil Interaction cluster: a factor assumed to reflect "thinking time" (verbal response latency), and eliciting verbalizations by the teacher. Taken together, these variables might argue for the importance of some kind of cognitive mediation process which is related to the observed performance outcome. The "thinking time" variable might represent a public referent for this process. Eliciting active, topic-relevant verbal interchange between teacher and pupils, and possibly among pupils as well, may represent a presthetic component promoting pleasant, task-oriented interactions contributing to a functional learning environment. This finding supports Solomon, Bezdek, and Rosenberg's (1964) results indicating that teacher's encouragement of verbal student participation increases the rate of the desired behavior. It is also consistent with Ryans (1960; 1961) findings that "understanding" or friendly, "organized" and "stimulating" teacher behaviors (assumed to be operative in a positive social-emotional climate), relate to "purposeful and "pro ductive" pupil behaviors. For Ryans "organization" refers to systematic vs. unplanned styles of performance.

In considering the data it is also indicated that there is an apparent unidimensionality of task-relevant pupil performance. Pupils who participate in one dimension

of task-oriented verbal behavior, for example, answering teacher, tend to generalize their participation to other verbal dimensions, such as discussing the task or spontaneously emitting topic-relevant comments. Hence, it may be expected that strengthening one domain of verbal participant behavior may positively generalize to other relevant domains.

The second most salient dimension indicated by both the V-Analyses and O-Analyses is represented by a group of variables that, taken together, might reflect a behaviorally constraining or inhibiting domain. In the Observation and Group Interaction cluster, teacher-interns exhibited much visual observation of students in general, interacting with groups rather than with individual pupils. Verbal interaction was extremely limited, pupils only answering teacher-interns' few comments or queries. Overall, the dimension reflects monitoring teachers who direct their observations and limited interactions to the class or groups of pupils, and who seem to promote little interactionally participant activity by the observed. The dimension is one of minor conceptual or theoretical interest. The third cluster, Teacher-Intern Disapproval, and its related O-Type is more interesting in that it reflects disapproving interactions between teacher-interns and pupils. Teacher-interns appear to concern themselves with direct intervention to inhibit "inappropriate" pupil performances. In this dimension,

pupil responses are all task-disruptive or irrelevant (e.g., pupil moves about in seat, talks out of turn, emits disruptive noises), and tend to occur when teacher-interns frequently use the blackboard. Teacher-interns' disapproval is conveyed principally by verbal comments of criticism or threats of punishment. Though the temporal relationship between events cannot be determined from the data, it is not unlikely that teacher-interns' disapproval follows pupils' task-irrelevant activities. This raises a question as to what extent the various forms of disapproval can generate increments in the undesired responses. What appears to be punishment can be reinforcing. A pupil may persist in "misbehaving" for example, in order to elicit attention from his teacher or peers (Skinner, 1968). As earlier noted, Thomas et al., (1968) provides evidence that pupils inappropriate behaviors (especially gross motor and noisemaking categories, as are included in this cluster) markedly increase with increments in the rate of teachers' verbal and nonverbal disapproval. Disruptive behaviors were also found to increase each time approving teacher behaviors were withdrawn. Verbal and nonverbal categories of teacher approval served to inhibit certain pupil behaviors. This may be a factor in the present findings. In this study it is indicated that teacher-interns' approval tends to be passively, nonverbally expressed whereas disapproval tends strongly to be explicitely, verbally communicated.

Interesting too, is the finding that frequent use of the blackboard relates to task-irrelevant verbal, vocal, and gross motor noisemaking behaviors by pupils (e.g., emitting unnecessary verbal and nonverbal noises, talking out of turn, wandering around the room, etc.), as indicated in the cluster describing teacher-interns' disapproval. Apparently teacher-interns are most likely to overtly disapprove of pupils' inattentiveness when using the blackboard as an instructional aid. Either inattentive behaviors are readily identified or teacher-interns tend to be more demanding of pupils' attention when this aid is used.

These results lead to the observation that the usage of this instructional aid represents interaction not so much as it does action directed toward addressees. Participation by pupils is minimal, and usually only under invitation by teacher. The implication is clear that conditions which provide for little or no inputs by pupils in form of active participation appear, not unexpectedly, to foster inattentive behaviors in that setting. This may in turn engender teachers' disapproval, setting the tone for a cycle of disapproving teacher-pupil, task-irrelevant interactions.

Limitations of the Research

A chief deficiency of this study derives from its methodology; as is generally true in the case of

non-laboratory research, the problem of uncontrolled variables is a significant issue. The implications of this issue are especially pertinent to the hypothesis-testing facets of the research.

In the experimental component of the study, several of the teacher-interns on the Fixed Interval schedule could not be observed at precisely the same hours over the period of observation. Another factor of note is the constraint imposed by equipment limitations. In focusing upon the teacher-intern as subject, the camera could not follow those pupils who wandered beyond the scope of the wide-angle lens. Hence, the duration of observation time for pupils varied, as well, often, as the pupils themselves from one observation session to the next. In this connection, consistently monitoring verbalizations was a problem throughout the study. In order to record verbal behaviors by the often highly mobile teachers, the cameraman (with microphone in the camera) had to follow his movements in the classroom, maintaining a distance not greater than six to twelve feet (depending upon background noise level); this was necessary to record the audio signal.

Perhaps the most obvious shortcoming of the research is that it contains no data allowing for determination of causal relationships among the variables examined. This, however, was beyond the scope of its design. In terms of the subjects of this study, it should be noted that the

results derive from and apply to the sample of Teacher Corps teacher trainees as described earlier. The findings may not be validly generalizable beyond the present sample.

Conclusions and Future Research

This study has provided evidence which suggests that Fixed and Variable Interval *schedules* of observation, as well as *observation* itself, exert little or no systematic effects on the spontaneous behaviors of observed teacher-interns in the classroom. Neither the schedule nor the observations appear to have functioned as discriminative or reinforcing stimuli for any categorized behavior. These results, however, generate further questions which future research might explore. What effect, for example, does the amount of elapsed time between observations have as an independent variable on the behavior of observed subjects? It is possible that a schedule of two observations per week may yield results different from those obtained by conducting observations at approximately two week intervals, though effects of satiation may still be an intervening variable. Also, the effect that observations may have as an established discriminative or reinforcing stimulus periodically programmed into the learning environment, is a moot issue. Conceiveably, observation could be employed as a strategy to promote, maintain, or eliminate critical teacher-learner behaviors in the classroom.

In regard to the exploratory phase of this study, results point up the importance of nonverbal media in an interactional context in the natural setting. Nonverbal behaviors, which previous research has shown to be associated with emotions, and which can communicate (and possibly regulate) affectivity in interactions (Argyle, 1969; Argyle and Kendon, 1967; Ekman, 1965; Ekman and Friesen, 1967; Galloway, 1962; Kendon, 1967; Scheflen, 1964) were found to be differentially related to discrete types of spontaneous social encounters in the classroom. Affectively pleasant, presumably supportive nonverbal responses by teacher-interns (smiling) was strongly related to enthusiastic, participant verbal activity by pupils. Specifically, the nonverbal component of a communication may often be more important than what is communicated in terms of content. In addition, the data further indicates that the task-appropriate pupil behavior which is related, tends to be highly interrelated and essentially unidimensional. Finally, the role of mediational processes, both in terms of teacher-interns' eliciting verbalization (probing), and pupil response latency or "thinking," was demonstrated to be highly related to pupil performance. We might attempt to encapsulate the findings relevant to task-relevant teacher-pupil interaction as follows: *Smiling, verbally probing teacher-interns are associated with thoughtful and responsive pupils over a variety of performance measures.*

What then are the implications for future research? Based on these data, such research should be directionally specific, and answer several specific questions, to wit:

1. Do teachers use smiling behavior in a non-contingent or contingent manner and can they be trained to elicit this behavior as a method by which behavior change may be effectuated;

2. What are the full consequences and processes in mediational activities engaged in by teachers and students;

3. Clarify the extent to which pupil performance is in fact unidimensional. In addition, it would be useful to examine the form and effects of pupils' reinforcing behaviors upon teachers.

Recognizing the responsibility assumed by the teacher as chief conditioning agent and programmer of behavior change communicated and effected through verbal and nonverbal media, it would seem to be important that teachers be trained systematically to control their own behaviors in ways which will improve the behaviors of the pupils they are teaching. Similarly, pupils should be made cognizant of their own behaviors and be systematically trained to emit responses which promote educationally relevant teacher behaviors. To the extent that teachers and pupils are knowledgeable of, and can control the ways in which they

respond to each other, the production of behaviors counter-productive to educational achievement may be avoided, and a supportive educational environment may be established which promotes the reciprocal achievement of appropriate behavioral changes in form of learning for both teachers and pupils.

REFERENCES

REFERENCES

Adams, H. E. and Frye, R. L. Psychotherapeutic techniques as conditioned reinforcers in a structured interview. Psychological Reports, 1964, 14, 163-166.

Argyle, M. Social Interaction. New York: Atherton Press, 1969.

Argyle, M. and Dean, J. Eye-contact, distance and affiliation. Sociometry, 1965, 28, 289-304.

Argyle, M. and Kendon, A. The experimental analysis of social performance. Advances in Experimental Social Psychology, 1967, 3, 55-98.

Ayllon, T. and Haughton, E. Modification of symptomatic verbal behavior of mental patients. Behavior Research and Therapy, 1964, 2, 87-97.

Bandura, A. Principles of behavior modification. New York: Holt, Rinehart, and Winston, 1969.

Bernstein, B. Social structure, language, and learning. Educational Research, 1961, June, 3, 163-176.

Birdwhistell, R. L. Paralanguage 25 years after Sapir. In H. W. Bresin (ed), Lectures on experimental psychiatry. Pittsburgh: University of Pittsburgh Press, 1961.

Birch, D. R. Effects of inquiry orientation and guided self-analysis using videotape on the verbal teaching behavior of intermediate grade student teachers. Unpublished doctoral dissertation, University of California, Berkeley, 1969.

Campbell, D. T., Kruskal, W. H., and Wallace, W. Seating aggregation as an index of attitude. Sociometry, 1966, 29, 1-15.

Carus, F. E. The use of closed circuit television (videotape) for psycho-galvanic response to increase the rate of change in student teachers' classroom performance. Unpublished doctoral dissertation, University of California, Berkeley, 1970.

Charney, E. J. Postural configurations in psychotherapy. Psychosomatic Medicine, 1966, 28, 305-315.

Condon, W. S. and Ogston, W. D. A segmentation of behavior. Journal of Psychiatric Research, 1967, 5, 221-235.

Dittman, A. T. and Lewellyn, L. G. Relationship between vocalizations and head nods as listener responses. Journal of Personality and Social Psychology, 1968, 9, 79-84.

Duncan, S. Nonverbal communication. Psychological Bulletin, 1969, 72:2, 118-137.

Ebel, R. L. Estimation of the reliability of ratings. Psychometrika, 1951, 16, 407-424.

Efran, J. S. Looking for approval: effects on visual behavior of approbation from persons differing in importance. 1968, University of Rochester (Mimeo.).

Efran, J. S. and Broughton, A. Effect of expectancies for social approval on visual behavior. Journal of Personality and Social Psychology, 1966, 4, 103-107.

Ekman, P. Communication through nonverbal behavior: a source of information about an interpersonal relationship. In S. S. Tomkins and C. E. Izard (eds.), Affect, cognition, and personality. New York: Springer, 1965.

Ekman, P. and Friesen, W. V. Nonverbal behavior in psychotherapy research. Research on Psychotherapy, 1967, 3.

Ellsworth, P. C. and Carlsmith, J. M. Effects of eye contact and verbal content on affective response to a dyadic interaction. Journal of Personality and Social Psychology, 1968, 10, 15-20.

Exline, R., Gray, D., and Schuette, D. Visual behavior in a dyad as affected by interview content and sex of respondent. Journal of Personality and Social Psychology, 1965, 1, 201-209.

Exline, R. and Messick, D. The effects of dependency and social reinforcement upon visual behavior during an interview. British Journal of Social Clinical Psychology, 1967, 6, 256-266.

Exline, R. V. and Winters, L. C. Affective relations and mutual glances in dyads. In S. S. Tomkins and C. E. Izard (eds.), Affect, cognition, and personality. New York: Springer, 1965.

Ferster, C. B. and Skinner, B. F. Schedules of reinforcement. New York: Appleton-Century-Crofts, 1957.

Franks, C. Behavior therapy: appraisal and status. New York: McGraw-Hill, 1969.

Galloway, C. M. An exploratory study of observational procedures for determining teacher nonverbal communication. Unpublished doctoral dissertation, University of Florida, 1962.

Galloway, C. M. Teacher nonverbal communication. Educational Leadership, October, 1966, 55-63.

Garrett, H. E. Statistics in Psychology and Education. New York: David McKay Co., 1971.

Gewirtz, J. L. and Baer, D. M. The effect of brief social deprivation on behaviors for a social reinforcer. Journal of Abnormal Social Psychology, 1958, 56, 49-56.

Goffman, E. Asylums. New York: Anchor Books, 1961.

Greenspoon, J. The reinforcing effect of two spoken sounds on the frequency of two responses. American Journal of Psychology, 1955, 68, 409-416.

Haas, K. Verbal conditioning of affective responses. Journal of General Psychology, 1962, 67, 319-322.

Hall, R. V., Lund, D., and Jackson, D. Effects of teacher attention on study behavior. Journal of Applied Behavior Analysis, 1968, 1, 1-12.

Hall, R. V., Panyan, M., Raben, D., and Broden, M. The use of systematic reinforcement by beginning teachers to achieve better classroom control. Journal of Applied Behavior Analysis, 1968, 1, 315-322.

Hildum, D. C. and Brown, R. W. Verbal reinforcement and interviewer bias. Journal of Abnormal Psychology, 1956, 53, 108-111.

Howsam, R. B. Who's a good teacher. Burlingame, Calif.: CSBA and CTA, 1960.

Hughes, M. Development of the means for the assessment of the quality of teaching in elementary schools. Salt Lake City: University of Utah, 1959.

Kanfer, F. H. and McBrearty, J. F. Minimal social reinforcement and interviewer content. Journal of Clinical Psychology, 1962, 18, 210-215.

Kanfer, F. H. and Phillips, J. S. Learning foundations of behavior therapy. New York: Wiley, 1970.

Kendon, A. Some functions of gaze direction in social interaction. Acta Psychologica, 1967, 26, 1-47.

Kendon, A. Movement coordination in social interaction: some examples described. Acta Psychologica, 1970, 32, 100-125.

Krasner, L. Studies of the conditioning of verbal behavior. Psychological Bulletin, 1958, 15, 148-171.

Krasner, L. and Ullmann, L. Research in behavior modification. New York: Holt, Rinehart, and Winston, 1965.

Little, K. B. Personal space. Journal of Experimental Social Psychology, 1965, 1, 237-247.

Madsen, C., Becker, W., and Thomas, D. Rules, praise, and ignoring: elements of elementary classroom control. Journal of Applied Behavior Analysis, 1968, 1, 35-45.

Mahl, G. F. Disturbances and silences in the patient's speech in psychotherapy. Journal of Abnormal and Social Psychology, 1956, 53, 1-15.

Matarazzo, J. D., Wiens, A. N., and Saslow, G. Studies of interview speech behavior. In L. Krasner and L.P. Ullman (eds.), Research in Behavior Modification, New York: Holt, Rinehart and Winston, 1965.

Medley, D. M. and Mitzel, H. E. Some behavioral correlates of teacher effectiveness. The Journal of Educational Psychology, 1959, 50, 239-246.

Mehrabian, A. The inference of attitudes from the posture, orientation and distance of a communication. Journal of Consulting Psychology, 1968, 32, 296-308.

Mitzel, H. E. and Rabinowitz, W. Assessing socio-emotional climate in a classroom by Whithall's technique. Psychological Monographs, 67:18, 1953.

Noblin, C. D., Timmons, E. O., and Reynard, M. C. Psychoanalytic interpretations as verbal reinforcers: importance of interpretation content. Journal of Clinical Psychology, 1963, 19, 479-481.

O'Leary, D. and O'Leary, S. Classroom Management: The Successful Use of Behavior Modification. New York: Pergamon Press, 1972.

Osgood, C. E. Dimensionality of the semantic space for communication via facial expressions. Scandinavian Journal of Psychology, 1966, 7, 1-30.

Ramp, E. A. and Hopkins, B. L. A New Direction for Education: Behavior Analysis, 1971, Vol. One. The University of Kansas, 1971.

Reynolds, G. S. A Primer of Operant Conditioning. Glenview, Ill.: Scott, Foresman and Co., 1968.

Rosenfeld, H. M. Instrumental affiliative functions of facial and gestural expressions. Journal of Personality and Social Psychology, 1966, 4, 65-72.

Rosenfeld, H. M. Nonverbal reciprocation of approval: an experimental analysis. Journal of Experimental Social Psychology, 1967, 3, 102-111.

Ryans, D. G. Characteristics of Teachers. American Council of Education: 1960.

Ryans, D. G. Inventory estimated teacher characteristics as covariants of observer assessed pupil behavior. Journal of Educational Psychology, 1961, 52, 91-97.

Sakoda, J. M., Cohen, B. H., and Beall, G. Test of significance for a series of statistical test. Psychological Bulletin, 1954, 51, 172-175.

Salzinger, K. Experimental manipulation of verbal behavior: a review. Journal of General Psychology, 1959, 61, 65-94.

Scheflen, A. E. The significance of posture in communication systems. Psychiatry, 1964, 27, 316-331.

Scheflen, A. E. Stream and structure of communicational behavior. Commonwealth of Pennsylvania, Eastern Pennsylvania Psychiatric Institute, 1965.

Skinner, B. F. Science and Human Behavior. New York: Macmillan, 1953.

Skinner, B. F. The Technology of Teaching. New York: Appleton-Century-Crofts, 1968.

Solomon, D., Bezdek, W. E., and Rosenberg, L. Dimensions of teacher behavior. The Journal of Experimental Education, 1964, 33, 23-40.

Spielberger, C. D., Berger, A., and Howard, K. Conditioning of verbal behavior as a function of awareness, need for social approval, and motivation to receive reinforcement. Journal of Abnormal and Social Psychology, 1963, 67, 241-246.

Spielberger, C. D. and DeNike, L. D. Descriptive behaviorism versus cognitive theory in verbal operant conditioning. Psychological Review, 1966, 73, 306-326.

Steller, N. and Freedman, P. A comparison of methods of observation in pre-service teacher training. Audio Visual Communications Review, 1964, 12, 177-197.

Steller, N. and Lesser, G. The use of television for improving teacher training and for improving measures of student teaching performance. Phase 11: A comparison of methods of observation in pre-service teacher training. New York: Hunter College of the City University of New York, 1963.

Taffel, C. Anxiety and the conditioning of verbal behavior. Journal of Abnormal Social Psychology, 1955, 51, 496-501.

Thomas, D., Becker, W., and Armstrong, M. Production and elimination of disruptive classroom behavior by systematically varying teachers' behavior. Journal of Applied Behavior Analysis, 1968, 1, 35-45.

Timmons, E. O., Noblin, C. D., Adams, H. E., and Butler, J. R. Operant conditioning with schizophrenics comparing verbal reinforcers vs. psychoanalytic interpretations: differential extinction effects. Journal of Personality and Social Psychology, 1965, 1, 373-377.

Truax, C. B. Reinforcement and non-reinforcement in Rogerian psychotherapy. Journal of Abnormal Psychology, 1966, 71, 1-9.

Tryon, R. C. and Bailey, D. E. Cluster Analysis. New York: McGraw-Hill, 1970.

Wachtel, P. L. An approach to the study of body language in psychotherapy. Psychotherapy: Theory, Research, and Practice, 1967, 4:3, 97-100.

Watson, O. M. and Graves, T. D. Quantitative research in proximic behavior. American Anthropologist, 1966, 1966, 68, 971-985.

Williams, J. H. Conditioning of verbalization: a review. Psychological Bulletin, 1964, 62:6, 383-393.

Willis, F. N. Initial speaking distance as a function of the speakers' relationship. Psychonomic Science, 1966, 5, 221-222.

APPENDIX A

CLASSROOM BEHAVIOR RATING SCHEDULE: TEACHERS AND PUPILS

APPENDIX A

CLASSROOM BEHAVIOR RATING SCHEDULE:

TEACHERS AND PUPILS

Teacher

Gesticulation

1. Baton Gesture

Definition. Movement of hand(s) and/or arm(s) which accents or emphasizes words or phrases. Movement must accompany speech.

Note: Count one discrete unit of occurrence when three or more consecutive seconds elapse between termination of gesture and onset of subsequent response. Directional gestures are not counted.

Example. Hand slicing through air; first thumping object; hand(s) up-turned with open palm(s); finger to ear signalling listen; finger to mouth signalling quiet; counting or showing fingers.

Measurement Scheme. Count number of occurrences over a five minute period.

2. Deictic Gesture

Definition. Directional movement of hand(s) pointing to an object(s) present in the classroom, or waving motion of hand(s) or arm(s). Movement may or may not accompany speech.

Note: Count one discrete unit of occurrence when three or more consecutive seconds elapse between termination of gesture and onset of subsequent response. Emphatic gestures are not counted.

Example. Pointing to items on blackboard, in book, or on paper; pointing to materials; waving motions of hand or arm signalling stop, approach, withdraw.

Measurement Scheme. Count number of occurrences over a five minute period.

Body Acts

3. Locomotion Strength: Large Movement.

Definition. Degree to which teacher moves body through classroom in movements of seven or more consecutive steps (a distance of three or more desks).

Measurement Scheme. Ten time samples over a five minute period, each sample of 10 seconds duration. (Note: count only one and first occurrence of response for each sample). Count number of samples in which response was recorded (N to 10).

4. Locomotion Strength: Small Movement.

Definition. Degree to which teacher moves body through classroom in movements of from one to six consecutive steps (a distance of less than three desks).

Measurement Scheme. Ten time samples over a five minute period, each sample of 10 seconds duration. (Note: Count only one and first occurrence of response for each sample). Count number of samples in which response was recorded (N to 10).

5. Locomotion Strength: Stationary.

Definition. Degree to which teacher is stationary in geographic space, making no discernable movement by taking steps or walking in the classroom.

Measurement Scheme. Ten time samples over a five minute period, each sample of 10 seconds duration. (Note: Count one and first occurrence of response for each sample). Count number of samples in which response was recorded (N to 10).

6. Locomotion Frequency.

Definition and Measurement Scheme. The total number of counted occurrences of items 3 and 4, large and small movements, by teacher.

Body Orientation

7. Gross Posture.

Definition. Position of teacher's body with reference to squatting or sitting position beside (within two feet of) pupil.

Note: Count one discrete unit of squatting/sitting when teacher arises. Do not rate teacher's sitting in front of group (as in reading group).

Measurement Scheme. Count number of occurrences over a five minute period.

8. Gross Posture: Duration.

Definition. The cumulative amount of time (in seconds) teacher is counted as squatting or sitting beside pupil (See item 7).

Measurement Scheme. Count cumulative duration in seconds for each counted occurrence of Gross Posture (7).

9. Position of Trunk: Forward.

Definition. Degree to which teacher's trunk is physically oriented toward (that is, leaning in the direction of) pupil. To be counted, teacher must talk to, look at, or touch pupil, or look at or touch pupil's materials in presence of pupil, or present material to pupil.

Note: Count one discrete unit of sitting when teacher arises. Rate "slouching" (drooping shoulders or hunched position while seated) as Erect.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

10. Position of Trunk: Erect.

Definition. Degree to which teacher's trunk is physically oriented along a ventrical axis, neither leaning toward nor away from pupil. To be counted teacher must talk to, look at, or touch pupil, or look at or touch pupil's materials in presence of pupil, or present material to pupil.

Note: Count one discrete unit of sitting when teacher arises. Rate "slouching" (drooping shoulders or hunched position while seated) as Erect.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

11. Position of Trunk: Backward.

Definition. Degree to which teacher's trunk is physically oriented away from (that is, leaning backward from) pupil. To be counted, teacher must talk to, look at, or touch pupil, or look at or touch pupil's materials in presence of pupil, or present material to pupil.

Note: Count one discrete unit of sitting when teacher arises. Rate "slouching" (drooping shoulders or hunched position while seated) as Erect.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

Facial Expression

12. Smile: Non-directional.

Definition. Degree to which teacher exhibits smiles (position of mouth in up-turned expression) without regard to any given target.

Note: Count one discrete unit of smile when mouth returns to non-smile position.

Measurement Scheme. Count number of occurrences over a five minute period.

13. Smile: Duration.

Definition and Measurement Scheme. The cumulative elapsed time between onset of Smile: Non-directional (Item 12) and return of mouth to non-smile expression for each counted occurrence of smile. The duration of each smile is measured in seconds.

14. Frown.

Definition. Degree to which teacher exhibits a frowning expression (position of eyebrows in knitted expression, forehead wrinkled).

Note: Count one discrete unit of frown when face returns to non-frown expression.

Measurement Scheme. Count number of occurrences over a five minute period.

Head Orientation

15. Head Nod.

Definition. Degree to which teacher exhibits up-down motion of head relative to axis of shoulders, while looking at or toward pupil.

Note: Count one discrete unit of head nod when up-down motion of head stops for three or more consecutive seconds.

Measurement Scheme. Count number of occurrences over a five minute period.

16. Head Shake.

Definition. Degree to which teacher exhibits side-to-side bilateral motion of head relative to axis of shoulders, while looking or toward pupil.

Note: Count one discrete unit of head shake when side-to-side motion of head stops for three or more consecutive seconds.

Measurement Scheme. Count number of occurrences over a five minute period.

Physical Orientation

17. Proximity: Close.

Definition. Degree to which teacher's body is within extended arm's reach of pupil. Teacher must look at, touch or talk to pupil, or look at pupil's materials in presence of pupil, or present materials to pupil.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

18. Proximity: Distant.

Definition. Degree to which teacher's body is beyond extended arm's reach of pupil, while teacher looks at, touches, or talks to pupil, or looks at pupil's materials in presence of pupil, or presents materials to pupil.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

19. Gaze Direction: Pupil.

Definition. Degree to which teacher's direction of gaze direction is toward pupil's face. Teacher must look at pupil to be counted.

Measurement Scheme. Ten time samples over a five minute period (still shot). Sum counted occurrences of item.

20. Gaze Direction: Other.

Definition. Degree to which teacher's direction of gaze is away from pupil's face. Teacher must not look at pupil to be counted.

Measurement Scheme. Ten time samples over a five minute period (still shot). Sum counted occurrences of item.

Physical Contact

21. Physical Contact: Approving.

Definition. Degree to which teacher exhibits positive physical contact with pupil which promotes contentment, comfort, or care of the pupil.

Note: Count one discrete unit of contact when teacher terminates contact (ceases to touch pupil).

Example. Lightly touching (any body part); holding hand or arm lightly (includes shaking hands); patting; embracing.

Measurement Scheme. Count number of occurrences over a five minute period.

22. Physical Contact: Approving-Duration.

Definition and Measurement Scheme. Cumulative duration of each counted occurrence of item 21, Approvint Physical Contact. Duration is recorded in seconds. Sum duration of counted occurrences.

23. Physical Contact: Disapproving.

Definition. Degree to which teacher exhibits negative physical contact with pupil which disrupts or inhibits pupil's ongoing behavior.

Note: Count one discrete unit of contact when teacher terminates contact (ceases to touch pupil).

Example. Forcibly holding; forcibly dragging or pulling; grabbing; pushing into position; shoving; shaking; slapping or hitting.

Measurement Scheme. Count number of occurrences over a five minute period

Punishment Procedures

24. Time-Out.

Definition. Degree to which teacher isolates pupil.

Example. Teacher removes pupil from classroom; isolates pupil by himself; turns back and waits for silence; turns lights out and says nothing; stops talking and waits for silence; places pupil behind screen; places pupil beside teacher's desk or in corner, etc.

Measurement Scheme. Count number of occurrences over a five minute period.

25. Removal of Privilege.

Definition. Enactment by teacher of removing pupil's rights, rewards, reinforcers, status, or privileges. Teacher must actively remove privileges and not merely threaten to remove them.

Example. Withholding or reducing pupil's playtime; keeping pupil in for recess; marking points against pupil or removing points earned by pupil.

Measurement Scheme. Count number of occurrences over a five minute period.

Verbal Behavior

26. Verbalization: Approving.

Definition. Degree to which teacher emits verbalizations directed to pupil which conveys approval, praise, or confirmation of pupil's behavior. These verbalizations encourage pupil's behavior, expressing pleasure by teacher.

Example. Fine; good; right; excellent; great; you're good; right on; bien (good); you're doing well; (like you; thank you; that's nice; that's fine; correct; perfect; wonderful; you did very well; okay.

Note: Count "okay" only when teacher emits word within one second of pupil's observable behavior.

Measurement Scheme. Count number of occurrences over a five minute period.

27. Verbalization: Disapproving.

Definition. Degree to which teacher emits verbalizations directed to pupil which indicates disapproval of or displeasure with, pupil's behavior. These verbalizations may disrupt pupil's ongoing behavior and may include statements of threat, punishment, or criticism.

Example. That's wrong; don't do that; quiet down; stop talking; be still; did I call on you; you're wasting time; stop that; you'd better not do that; I don't like that; shut up; settle down; dummy; stupid; wipe that look off your face; that's not nice; what did I tell you to do; get busy right now; you're not doing what I told you to do; behave; I'll make you stay after class.

Measurement Scheme. Count number of occurrences over a five minute period.

28. Verbalization: Total Disapproving.

Definition and Measurement Scheme. Total number of counted occurrences of item 27, Disapproving Verbalizations by teacher.

29. Eliciting Verbal Elaboration.

Definition. Degree to which teacher asks pupil's to explain or amplify own or other's statement, comment, or question.

Example. What do you (does he) mean by that; how do you mean that; anything else; tell me more; explain; anything to add; I don't understand what you mean--explain it.

Note: Any question on the same topic, asked by teacher of the same pupil following pupil's initial answer to question, is counted as request for explanation or elaboration of topic, and is to be rated in this category.

Measurement Scheme. Count number of occurrences over a five minute period.

30. Verbal Questions.

Definition. Degree to which teacher asks pupil a specific question calling for a direct, single verbal response by pupil. Requests by teacher for clarification, elaboration, or explanation of topic is not counted in this category.

Example. What _____?; Who _____?; Why _____?; When _____?; Where _____?; Can _____?; How _____?; Do you know _____?; Is _____?

Note: Any question on the same topic asked by teacher of the same pupil following pupil's initial answer to question, is counted as request for explanation or elaboration of topic, and is not to be rated in this category.

Measurement Scheme. Count number of occurrences over a five minute period.

Usage of Instructional Aids

31. Usage of Blackboard: Occurrences.

Definition. The number of discrete occurrences that teacher uses blackboard as instructional aid for pupil, by writing or drawing on blackboard in presence of pupils or verbally or physically referring to items on blackboard by directing pupil's attention to it.

Note: Count one occurrence of Use of Blackboard when three or more consecutive seconds elapse between end of teacher's verbal or physical reference to board and onset of subsequent verbal or physical reference to board. Rate in this category each occurrence of pupil's usage of blackboard (that is, writes or draws on board, or emits verbal or physical reference to items on board) under teacher's direction and in presence of teacher.

Measurement Scheme. Count number of occurrences over a five minute period.

32. Usage of Blackboard: Duration.

Definition and Measurement Scheme. The cumulative amount of elapsed time in seconds for each discrete occurrence of teacher's usage of blackboard as instructional aid for pupil as defined in item 31.

33. Usage of Instructional Material: Occurrences.

Definition. The number of discrete occurrences when teacher uses instructional materials (exclusive of blackboard) as instructional aid for pupils.

Example. Books, drill cards, maps, charts, pictures, photos, graphics, prepared lesson cards.

Note: Count one occurrence of Usage of Instructional Material when three or more consecutive seconds elapse between end of teacher's verbal or physical reference to materials and onset of subsequent verbal or physical reference to materials. Teacher's usage of blackboard should not be counted in this category. Teacher must verbally or physically refer to materials in presence of pupils. Include in this category occurrences wherein teacher looks at pupil or pupil's materials or follows along in own materials while pupil reads aloud or uses instructional item.

Measurement Scheme. Count number of occurrences over a five minute period.

34. Usage of Instructional Materials: Duration.

Definition and Measurement Scheme. The cumulative amount of elapsed time in seconds for each discrete occurrence of teacher's usage of instructional materials as instructional aid for pupils, as defined in item 33.

Teacher-Pupil Interaction

35. Interaction--Individual.

Definition. Degree to which teacher exhibits verbal and nonverbal behavioral interaction with a single, individual pupil. Rate only if teacher looks at and/or

touches and/or talks to pupil, or identifies pupil by name, and/or looks at or touches pupil's materials in presence of pupil, of presents materials to pupil. This category also includes teacher's listening to individual pupil reading aloud (that is, teacher looks at book or materials while pupil reads aloud from his own book or materials).

Note: Indicate if only one pupil is present in observation space. In the case of multiple behavior events directed by teacher to same pupil, the following rule applies: one discrete contact between teacher and same pupil is rated each time five or more consecutive seconds have elapsed between end of teacher's behavior event (defined above) and onset of subsequent behavior event.

Measurement Scheme. Count cumulative duration in seconds for each occurrence of individual interaction, over a period of five minutes.

36. Interaction--Group.

Definition. Degree to which teacher exhibits verbal and nonverbal behavioral interaction with two or more pupils at the same time. A behavioral interaction is defined as teacher's looking at and/or touching and/or talking to pupils, or looking at or touching pupils' materials in presence of pupils or presenting materials to pupils.

Note: In the case of multiple behavior events directed by teacher to same pupils--simultaneously--the following rule applies: One discrete contact between teacher and same pupils is rated each time five or more consecutive seconds have elapsed between end of teacher's behavior event (defined above) and onset of subsequent behavior event.

Example. Story-telling; reading to group; demonstrating or showing something to group; singing to groups; giving instructions to group; addressing group as whole.

This category is rated only if teacher does not single out, recognize or identify any specific individual pupil, directing behavior event to the selected individual.

Measurement Scheme. Count cumulative duration in seconds for each occurrence of group interaction over a period of five minutes.

37. Interaction--Undetermined.

Definition. Rate only if unable to classify direction of teacher's behavioral contact as either Individual or Group. This category includes teacher's direction of behavior to targets outside the observation space (i.e., beyond the field of vision).

Measurement Scheme. Count cumulative duration in seconds for each occurrence of undetermined interaction over a period of five minutes.

Facial Attraction

38. Attraction: Pleasant/Unpleasant.

Definition. Ordinal judgment of perceived degree of teacher's facial attraction.

Measurement Scheme. Rate full face shot. Score Not Attractive, 1; Attractive, 2; and Very Attractive, 3.

Teacher Objects (Pupil)

Verbal Behavior

39. Answering Teacher--Individual.

Definition. Degree to which individual pupils answer teacher's questions or respond verbally when called upon or recognized by teacher. This category includes pupils' reading aloud as teacher directs.

Note: Each verbal response by pupil following a question asked by teacher is counted as one unit of occurrence. Count only verbal responses by one individual alone. Do not count simultaneous responses by more than one pupil.

Measurement Scheme. Count number of occurences over a five minute period.

40. Spontaneously Answering Teacher--Individual.

Definition. Degree to which individual pupils answer teacher's questions or respond verbally to teacher without teacher's calling upon or recognizing pupil.

Note: Each verbal response by pupil following a question asked by teacher is counted as one unit of occurrence. Count only verbal responses by one individual alone. Do not count simultaneous responses by more than one pupil.

Measurement Scheme. Count number of occurrences over a five minute period.

41. Answering Teacher--Group.

Definition. Degree to which two or more pupils simultaneously answer teacher or respond verbally when called upon or recognized by pupils. This category includes reading aloud or singing aloud as teacher directs.

Note: Each verbal response by two or more pupils following a question asked by teacher is counted as one unit of occurrence. Do not count individual responses by one pupil alone.

Measurement Scheme. Count number of occurrences over a five minute period.

42. Spontaneously Answering Teacher--Group.

Definition. Degree which two or more pupils simultaneously answer teacher's questions or respond verbally to teacher without teacher's calling upon or recognizing pupils.

Note: Each verbal response by two or more pupils following a question asked by teacher is counted as one unit of occurrence. Do not count individual responses by one pupil alone.

Measurement Scheme. Count number of occurrences over a five minute period.

43. Verbal Latency: Individual.

Definition. Degree to which individual pupil delays emitting verbal response to teacher's question or request for verbal response, directed specifically to individual pupil.

Note: Count only individual responsiveness. Do not count simultaneous responses by two or more pupils.

Measurement Scheme. Measure latency of verbal response over a five minute period (that is, amount of elapsed time in seconds between end of teacher's verbalization and onset of pupil's verbal response for each separate question or request for verbal response by teacher).

44. Verbal Latency: Group.

Definition. Degree to which pupils delay emitting verbal response to teacher's question or request for verbal response, directed specifically to two or more pupils at the same time.

Note: Count only simultaneous responses by two or more pupils. Do not count individual responsiveness.

Measurement Scheme. Measure latency of verbal response over a five minute period (that is, amount of elapsed time in seconds between end of teacher's verbalization and onset of pupil's verbal response for each separate question or request for verbal response by teacher).

45. Asking Teachers' Question(s).

Definition. Degree to which pupil elicits teacher verbalization by asking teacher specific questions. Count occurrences wherein pupil asks teacher to explain or amplify own or others' verbalization or asks teacher to explain or elaborate on assignment or explain use of materials.

Note: Each teacher-pupil interaction (that is, single, specific question by pupil followed by teacher's response) counts as one occurrence. Teacher's response to pupil's question may include statement, comment, or question.

Example. What _____? How _____? Why _____? Who _____? Where _____? When _____? Can _____? Is _____? Tell me _____? I don't understand _____? Verbalizations are directed by pupil to teacher.

Measurement Scheme. Count number of occurrences over a five minute period.

46. Discussion of Task.

Definition. Degree to which pupil talks about assignment or task-relevant topic to teacher. This category excludes questions asked by pupil (see item 44).

Note: This category does not include pupil's initial answer or verbal response to teacher's question. Count only pupil's discussion of task with teacher.

Example. Verbalizations by pupil which extend discussion of topic relevant to the teacher-designated task or assignment, including anecdotal reports and statements or comments by pupil elaborating topic.

Measurement Scheme. Count number of occurrences over a five minute period.

47. Task-Irrelevant Verbalization.

Definition. Degree to which pupil's verbal responses to teacher are irrelevant and unrelated to teacher-designated topic or assignment. These pupil responses include answering or asking questions, and include responses directed to teacher and/or pupils.

Example. Pupil talks about play period activities during math assignment; pupil talks about other's activities when asked by teacher to read aloud.

Measurement Scheme. Count number of occurrences over a five minute period.

48. Paralingualism.

Definition. Degree to which pupil emits non-verbal vocalizations which are clearly audible and detectable.

Note: Count one unit of paralingual noise for same pupil when five or more consecutive seconds have elapsed between termination of noise event and onset of subsequent paralingual vocalization.

Example. crying; screaming; singing (when not authorized or sanctioned by teacher); whistling; clicking tongue; blowing.

Measurement Scheme. Count number of occurrences over a five minute period.

49. Eliciting Peer Verbalization.

Definition. Degree to which pupil inappropriately elicits verbalizations by peers. This category is to be rated only when pupil carries on conversation at the same time teacher speaks to pupil or addresses class as a whole or when teacher indicates that pupils are to listen to another pupil, or are instructed to tend quietly to work. Rate pupil who elicits (that is, first initiates) verbal behavior and pupil who verbally responds to eliciting pupil.

Note: Count one discrete occurrence of eliciting behavior for pupil when five or more consecutive seconds have elapsed between verbalizations by same pupil.

Measurement Scheme. Count number of occurrences over a five minute period.

Visual Orientation

50. Gaze Direction: Toward Teacher.

Definition. Degree to which pupil's direction of gaze is away from teacher or teacher-designated stimulus.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

51. Gaze Direction: Other.

Definition. Degree to which pupil's direction of gaze is away from teacher or teacher-designated stimulus.

Measurement Scheme. Ten time samples over a five minute period (still shots). Sum counted occurrences of item.

Motor Activity

52. Gross Motor Activity.

Definition. Degree to which pupil exhibits body activities involving gross muscular movements which have not been sanctioned, requested, or designated by teacher. This category excludes physical contact behaviors with other persons (see items 56 and 57).

Note: Count one discrete unit of occurrence when five or more consecutive seconds have elapsed between termination of behavior event and onset of subsequent behavior event rated in this category.

Example. Getting out of seat; standing up; running; walking around; hopping; skipping; jumping; moving chair or desk; rocking body without moving chair; arm-flailing; stamping feet; crawling.

Measurement Scheme. Count number of occurrences over a five minute period.

Noisemaking Activity

53. Noisemaking.

Definition. Degree to which pupil exhibits any nonverbal and nonvocal noisemaking activities which do not involve other persons and which are clearly identifiable and audibly detectable. Count only behaviors which have not been authorized or sanctioned by teacher.

Note: Count one discrete unit of occurrence when five or more consecutive seconds have elapsed between termination of behavior event and onset of subsequent behavior event rated in this category.

Example. Tapping feet; tapping objects; clapping, rattling or tearing papers; throwing books or materials on desk or floor; slamming desk; kicking desk, chair, or other objects; scraping or dragging objects; throwing objects.

Measurement Scheme. Count number of occurrences over a five minute period.

Mouthing

54. Mouthing Objects.

Definition. Degree to which pupil brings objects into contact with mouth. Count occurrences of eating in this category.

Note: Count one discrete unit of occurrence of mouthing when object is removed from contact with mouth.

Example. Sucking thumb or fingers; mouthing pencil; chewing gum.

Measurement Scheme. Count number of occurrences over a five minute period.

Object Disturbance

55. Disturbance of Others' Property.

Definition. Degree to which pupil disturbs property by grabbing, kicking, throwing, hitting or destroying property owned by another person.

Measurement Scheme. Count number of occurrences over a five minute period.

Physical Contact

56. Physical Contact: Negative.

Definition. Degree to which pupil exhibits physical contact which inhibits or disrupts ongoing behavior of the person touched.

Note: Count one discrete unit of contact when pupil ceases to touch target.

Example. Hitting; striking; kicking; shoving; pinching; dragging; slapping; biting.

Measurement Scheme. Count number of occurrences over a five minute period.

57. Physical Contact: Positive.

Definition. Degree to which pupil exhibits physical contact which promotes comfort, care or contentment of the person touched.

Note: Count one discrete unit of contact when pupil ceases to touch target.

Example. Lightly touching; patting; lightly holding; embracing; kissing; shaking hands.

Measurement Scheme. Count number of occurrences over a five minute period.

APPENDIX B

FORMULA FOR COMPUTATION OF INTRACLASS CORRELATION COEFFICIENT BY ANOVA

APPENDIX B

FORMULA FOR COMPUTATION OF INTRACLASS CORRELATION COEFFICIENT BY ANALYSIS OF VARIANCE TO YIELD ESTIMATE OF RELIABILITY OF RATINGS.*

$$r = \frac{\text{MS subjects - MS error}}{\text{MS subjects}}$$

$$\text{(a) MS error} = \frac{\text{SS total - SS subjects - SS raters}}{\text{df error}}$$

$$\text{(b) df error} = (N_{\text{raters}}-1)\ (N_{\text{subjects}}-1)$$

*(See Ebel, 1951.)