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AN OVERVIEW OF THE TEACHING RESEARCH SYSTEM FOR THE DESCRIPTION OF TEACHER BEHAVIOR IN CONTEXT.

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This overview describes a system for measuring instructional and management parameters of teaching through a method of classroom observation in which live observers and video tapes record teacher and learner behavior (both verbal and nonverbal) and the social-political-physical characteristics of the setting. Presentation is in 3 sections: (1) the methodology of the system, including the units of measurement employed in the analysis of teacher-learner interaction, the recording procedures followed, and the nature of the data that derive from the interaction analysis; (2) the content of the system, that is, the dimensions of teaching behavior, child behavior, and setting described; and (3) evidence of the utility of the system, based on tests of validity and reliability. Ten tables and 8 figures are used to illustrate the conceptual basis of the system, relationships between the contextual variables it measures, categories used to describe the 4 aspects of teacher and learner behavior (focus, teaching operation, affective qualities, substantive content), etc. A 19-item bibliography is included. This system evolved as an adjunct to the Teaching Research project "Increasing Prediction of Teachers' Classroom Behavior Through Use of Motion Picture Tests"; the final report of that project is also in the ERIC collection. (JS)

an overview of the
TEACHING RESEARCH System
for the description of
Teaching Behavior in Context

H. Del Schalock
Research Professor
December, 1967

TEACHING RESEARCH
A Division of the Oregon State System
of Higher Education

An Overview of

The TEACHING RESEARCH System

For the Description of Teacher Benavior in Context

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Monmouth, Oregon

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Mr. Sidney Micek
Mrs. Joyce Schalock
Mrs. Virginia Weigel

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Monmouth, Oregon

H.D.S.

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INTRODUCTION

The observation system to be described in the pages which follow (hereafter referred to as the TR System) represents an effort to develop a conceptually sound, relatively exhaustive measure of teaching behavior and the contextual variables which influence it. In developing the system, advantage has been taken of the work of others who have been interested in describing teaching behavior, for example, Hughes (1959), Flanders (1960), Smith (1964), Bellack (1963, 1965), Aschner and Gallagher (1963), and Taba (1964); the work of Bales (1950) in the study of small group interaction; and the work of Bishop (1951), Moustakas, Sigel, and Schalock (1956), and Schalock and O'Neill (1960) in the study of parent-child interaction. An effort has been made in the present system, however, to move beyond these previous efforts and to overcome many of their limitations (Schalock, 1967). Specifically, an effort has been made to tie the system conceptually to that which is known about cognitive development and the teaching-learning process, to include in it a running account of both teacher and learner behavior, to make it inclusive of both the instructional and the management parameters of teaching, to use as a data base both the verbal and non-verbal aspects of teacher-learner interaction, and to conceptualize teaching behavior so as to make the system applicable across a wide range of ages and settings, e.g., the home or nursery school, the playground or classroom, the elementary or the secondary school. In addition, the TR System provides a detailed record of the setting variables which influence teacher and/or child behavior, e.g., the activity in which a class is involved, the characteristics of the children in the class, the physical characteristics of the classroom, and the occurrence of unusual events which vary the ordinary routine of a classroom. In short, the observation system represents an attempt to develop a means of looking at teaching behavior wherever and whenever it occurs and to describe it as occurring in relation to the full range of factors which influence it.

Conceptually, the system is based on the generally accepted principle that behavior is always a function of an individual interacting with his immediate environment ($B = fPE$). Translated to teaching, this means that the behavior of a teacher is always a function of an interaction between the personality characteristics, competencies, etc. which she brings to a given situation and the characteristics of the learners, instructional materials, instructional objectives, and administrative climate which she finds there. Translated to the study of teaching, it means that in order to understand teaching behavior, or to study it meaningfully, the context within which it occurs must always be considered. This is the case whether one is attempting to describe teaching behavior, explain it or predict it. Since the TR System has as its purpose the description of teaching behavior it follows that it must include a description of the contextual variables which influence it. The relationship between some of the dimensions of context and teaching behavior is illustrated schematically in Figure 1.

While a system that describes teaching behavior ideally should describe all four classes of contextual variables the TR System describes only two of them, learner behavior and the social-political-

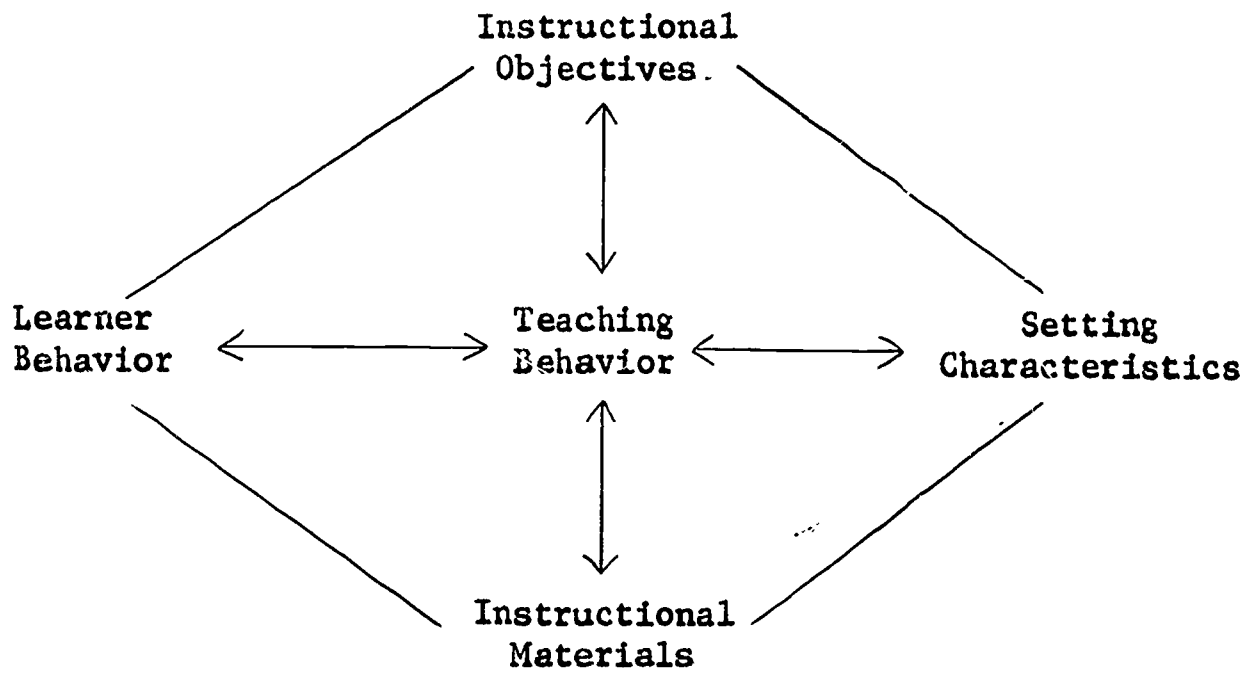

Figure 1. Four dimensions of the instructional context, and their relationship to teaching behavior.

physical characteristics of the setting. A procedure exists whereby instructional objectives can be related to the data that derive from the system, and a running record of the materials being used in instruction is maintained, but as of now the system does not provide for a detailed analysis of the interaction between teaching behavior, instructional objectives and instructional materials.

By adopting the position that a system for describing teaching behavior must include in it procedures for describing the contextual variables that influence it, a methodological problem is encountered that goes beyond that of specifying <u>what</u> is to be described and <u>how</u> it is to be described, namely, the problem of developing <u>a procedure whereby all of the various elements that are being described by the system are related to one another in real time</u>. This requires extremely complex, sophisticated recording and data processing procedures. Toward this end, the TR System makes use of both live observers and audio or audio-video tapes for recording purposes and a computer based system (currently under development) for tabulating and ordering the data. In combination, these procedures permit a methodology of sufficient sophistication to handle the demands of the system.

The purpose of the present statement is simply to introduce the reader to the system. Toward this end, three major aspects of the system will be reviewed: 1) the methodology of the system, including the units of measurement employed within it, the recording procedures followed, and the nature of the data that derive from it; 2) the content of the system, that is, the dimensions of teaching behavior, child behavior, and setting described; and 3) the utility of the system. Details of the conceptual framework which structures the system and the detailed definitions, examples, decision rules, and

recording procedures which make the system operational are not included in the present statement. This information may be found, respectively, in: 1) a monograph entitled The Conceptualization and Measurement of Teaching Behavior (Schalock, 1967b, in preparation), and 2) the training manual that accompanies the system (Schalock, Micek, and Wigel, 1967, in preparation). An early draft of the system appears in a final report of a project supported by the U. S. Office of Education (Schalock, Beaird, and Simmons, 1964).

THE METHODOLOGY OF THE SYSTEM

Operationally, the system requires that a human observer apply memorized, preconceived category sets to the description of teacher and learner behavior, maintain a running record of the subject areas and instructional activities pursued, and obtain through interview with the teacher a description of the setting variables operating in the classroom. Methodologically, the description of teacher and learner behavior and the description of the activities pursued in the classroom constitute a single "operational unit" within the system; the description of the social, political and physical characteristics of the instructional setting through interview with the teacher constitutes another. Since the methodologies employed in these two units of the system are totally different, each will be described separately.

The Methodology Used in Describing Teacher-Learner Interaction

Two separate interaction analyses are made in the system, one involving face-to-face observation as instruction occurs, and one involving an analysis of an audio or audio-video tape of the instruction after it has occurred. The face-to-face observation serves as the basic data source in the system, providing information on the FOCUS of both teacher and learner interaction, the verbal and non-verbal INSTRUCTIONAL OPERATIONS employed by a teacher, and the AFFECTIVE QUALITIES accompanying both teacher and learner behavior. It also provides a running record of the classroom activities accompanying instruction. The audio or audio-video tapes provide the basis for an analysis of the CONTENT of the instruction-learning process. Both analyses employ the same methodology, however, so a single description of the procedures employed in the analysis of interaction will suffice.

Units of Measurement Employed in the Analysis of Teacher-Learner Interaction. For purposes of the present system the basic unit of measurement employed is defined in terms of a message or a "unit of meaning." Within this framework two units of measurement are employed, the interact, and the interactive exchange. The interact represents the basic unit of measurement, and is defined generally as a message that is directed to another. A message is further defined as a single unit of influence that one person exerts upon another. Within this definition a message may consist of a sign or a gesture, for example, a wave of the hand, a nod of the head, or a finger to the lip to indicate quiet; a single word, for example, "Yes" or "No" or "Later;" a phrase or a sentence; or a series of sentences. As used in the present system, the length of a message or the means by which it is communicated is incidental to the classification process so long as the nature and/or intent of the effort to influence remains the same. The interact is considered as the basic unit of measurement in the system because it is always that which is classified or categorized.

The second unit of measurement employed in the system is the interactive exchange. This is defined as a series of interacts or messages exchanged sequentially by two or more people that are

inter-related or that have a common base through the fact that the entire sequence of interaction grows out of and relates to the interact that opened the exchange. The notion of an interactive exchange derives from the S-R-R-paradigm, where a stimulus (e.g., a question or a demand) triggers a response, the response triggers another response, etc., until the exchange runs its course. In this sense, an interactive exchange always involves at least two interacts. It has no set upper limit. As with the classification of interacts, the nature of the influence techniques used within the context of the interactive exchange are incidental to the recording of the interactive exchange; the determining factor is that all of the interacts within the sequence flow from and are tied to the message which opens the interchange.

Recording the Interaction. In recording live in the classroom, the observer has four tasks: 1) the identification of each interact (verbal or non-verbal message) exchanged between teacher and student(s); 2) the classification of each interact in terms of its focus, its affective qualities and the instructional or management operation it represents; 3) the recording of the various interacts in patterns which correctly reflect the order and sequence of the interactive exchange, and 4) the recording of the subject matter area and classroom activity within which the interaction is occurring. All observations are recorded in running record form, by hand, on an observation sheet (see Figure 2). The category description of the interaction is entered on the right hand side of the sheet; the description of classroom activities, subject matter being pursued, etc. on the left. In recording interaction the observer keeps his attention directed to the teacher, recording all that flows from her and all that flows to her that receives a response. Any behavior in the classroom that does not involve the teacher's attention is not recorded.

SUBJECT_____ OBSERVATION 1 2 3

OBSERVER_____ PAGE_____

DATE_____

Classroom Structure	Activities and Topics	Progressive Record of Teacher-Learner Interaction

Figure 2. The form on which the categories descriptive of teacher-learner interaction are recorded.

The model used in recording interaction involves a three-stage interactive exchange: 1) a stimulus (demand) situation operating upon the teacher, 2) a response on the part of the teacher to the demand situation, and 3) the response of a child or group of children to the teacher's response. Using this model, three primary patterns of interaction can be identified: a) where a teacher initiates interaction from her own, internal demand state, that is, no immediate cues within the situation can be identified as stimuli inviting of response on the part of the teacher, e.g., when a teacher gives instructions or directions for an assignment; b) where a teacher opens the interaction but her behavior is in response to a child or situation in the classroom which invites response, e.g., when she responds to a child looking out of the window or talking to another child; and c) where a child initiates the interaction, e.g., when a child asks a question or raises his hand. By using the three-stage interaction model, and by recording the interaction pattern in terms of who initiates the interaction, the behavior of a teacher can be related explicitly to the behavior of a child or children, and vice versa. The model also permits the recording of interactive exchanges that extend over time, that is, that go beyond the basic three-stage model.

These same procedures are followed in recording from the audio tapes, the only difference being in the category sets used in the analysis. Rather than classify the FOCUS, INSTRUCTIONAL OPERATIONS and AFFECTIVE QUALITIES involved in the interaction the observer here has to classify only the CONTENT of the interaction. Only two content related analyses are included in the system as it presently stands, 1) an analysis as to the convergence-divergence of the educational outcomes being pursued by a teacher (Aschner and Gallagher, 1963), and 2) an analysis of the cognitive processes of the learner that are being exercised (Taba, 1964). In making these analyses, coders may work either directly from the tape or from a typescript of the tape.

If video-tape is used to record the live classroom observation, then both the live classroom analysis and the tape coding analysis are applied to the tapes. While no empirical data are available on the matter, experience in using the live observer and the audio-tape appears to provide richer or more complete data than does the use of the video recorder alone.

The Nature of the Data that Derive from the Interaction Analyses. The interaction data which come from the system are of two kinds, category frequency counts (which derive from the classification of interacts) and patterns of interaction (which derive from the recording of interactive exchanges). In looking at the frequency count data, categories may be considered individually or in combination, e.g, the frequency of appearance of category A or B, the combined frequency of categories A + B, or the ratio of categories $\frac{A + B}{A + B + X}$. All three approaches have been taken in working with the data thus far. Individual teacher profiles have been prepared on the basis of single and combined

category frequency counts, and complex ratio measures have been used as criterion measures in predictive and experimental studies. Examples of ratio measures used are:

1) Degree of Control = $\frac{\text{All instances of control}}{\text{All teacher acts}}$

2) Orientation to the use of Power in Bringing about Control = $\frac{\text{All instances of control which involve the use of high power}}{\text{All instances of control}}$

3) Affective Orientation = $\frac{\text{All instances of positive affect}}{\text{All instances of positive affect, negative affect and upset}}$

4) Orientation to the use of questions = $\frac{\text{All instructional questions asked}}{\text{All instructional acts}}$

5) Orientation to the functional use of questions = $\frac{\text{All instructional questions asked for the purpose of monitoring information store}}{\text{All instructional questions asked}}$

The categories used in the FOCUS, OPERATIONS, AFFECTIVE, and CONTENT analyses are described in the next section of the paper.

Pattern data are of two kinds, a) that which reflects the sequence of influence techniques used within an interactive exchange, e.g., the progression in power used by a teacher in modifying behavior of a particular kind, or the shift in instructional tactics used by a teacher when dealing with an instructional task over time, and b) that which reflects the initiation and response patterns on the part of the teacher and child(ren) in a particular teaching-learning situation. In combination the frequency count and the pattern data permit rich and varied analyses to be applied to the description of interaction that derives from the system.

The Methodology Used in Describing the Instructional Setting

Two separate measures are obtained in attempting to describe the social, political and physical characteristics of the instructional setting, one based upon an interview with the teacher and one based upon a running record of events maintained by the teacher. The interview has three foci: 1) the nature of the physical setting within which instruction occurs, e.g., the number of children in the room, the size of the room, lighting, ventilation, and approximation to noise, 2) the nature of the children in the class, e.g., the general socio-economic level of families served by the school, the general ability level of the children in the class, the boy-girl ratio in the class, and the number of habitually disruptive children in the class, and 3) the orientation of the school administration toward teacher autonomy, classroom discipline, instructional materials, etc. A standardized interview form is used. This is described in detail in the next section of the paper.

The running record of events maintained by the teacher on the day that classroom observations are made has as its focus any "unusual" events that occur during the course of the day which might change the usual pattern of classroom interaction. A specially prepared recording form is provided the teacher for this purpose (see next section). Both the unusual event form and the interview data are obtained from the teacher <u>after</u> the observations have been completed.

THE CONTENT OF THE SYSTEM

The system is composed of three major category sets: those descriptive of teacher behavior, those descriptive of learner behavior, and those descriptive of the situation in which teacher-learner interaction is taking place. In the present section of the paper the categories comprising each of these sets will be described.

Dimensions of Teacher Behavior Described by the System

In deciding upon the dimensions of a teacher's behavior to be included in a system such as this, the researcher is faced with three levels of decision: 1) a decision as to what properly can be considered "teaching" behavior within the complex of behavior that characterizes a parent's or teacher's interaction with children, 2) a decision as to the kinds of analyses to be applied to that which one finally calls "teaching" behavior, and 3) a decision as to the specific categories to be used within these analyses. Unfortunately, there are few guidelines at present to help in reaching a decision at any of these levels. While it is true that a number of classificatory systems exist, cf. Flanders (1960), Suchman (1962), Aschner and Gallagher (1963), Bellack (1963, 1965), Smith (1964), Taba (1964), they are sufficiently limited in scope or sufficiently lacking in theoretical or empirical validation that they are of limited value in this respect (Schalock, 1967a) (Openshaw and Cyphert, 1967). Educators simply have not as yet specified what it is that constitutes teaching behavior, what it is that differentiates teaching behavior from other classes of influence behavior, or what kinds of analyses can most profitably be applied to that which is identified as teaching behavior. A major purpose of the present effort is to provide a first approximation to a conceptual framework which speaks to these issues.

Toward this end it is proposed that at least four kinds of analyses can be applied to teaching behavior: 1) an analysis of the FOCUS of a teacher's behavior, that is, the class of outcome or class of activity toward which she is directing attention, 2) an analysis of the TEACHING OPERATIONS being used, that is, an analysis of the structure and function of teaching behavior, 3) an analysis of the AFFECTIVE QUALITIES that accompany a teacher's behavior, and 4) an analysis of the CONTENT of a teacher's behavior. It is also proposed that these four analyses derive from totally different theoretical and empirical considerations and require for their solution totally different category sets. Broadly speaking, it is proposed that the FOCUS analysis derives from developmental theory and the idea that a variety of classes of influence behavior need to be directed to the human organism to insure its continued growth and/or well-being; that the TEACHING OPERATIONS analysis derives from the literature on learning and the traditional concern in education with "how" a thing is taught; that the AFFECTIVE analysis derives from the literature on learning "climates;" and that the CONTENT analysis derives from the literature on the "structure" of knowledge and the traditional concern in education with "what" is being taught. The relationship between these four analyses is depicted in Figure 3.

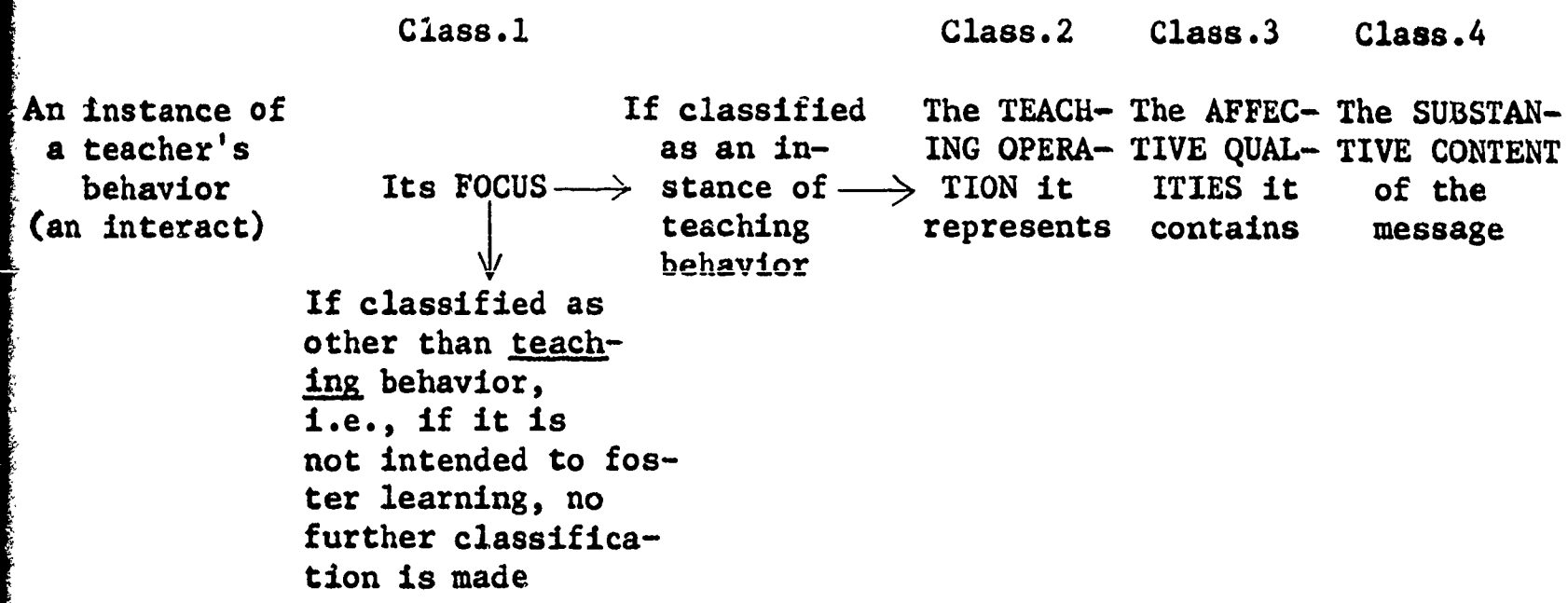

Figure 3. A schematic representation of the relationship between the four analyses applied to each instance of a teacher's behavior, i.e., each interact.

While these four analyses vary widely in form and substance, it is proposed that they are complimentary and that a complete description of teaching behavior requires all four analyses to be brought to the task. Operationally, this requires that each instance of teaching behavior (in this case each message) receive a four-way classification, once to identify its FOCUS, once to identify the TEACHING OPERATION it represents, once to identify its AFFECTIVE QUALITIES, and once to specify its CONTENT. As indicated earlier, as it now stands, the TR System includes only the first three analyses, although two "content related" sub-analyses are made. While the lack of an analysis of content precludes the system being exhaustive in its description of teaching behavior, it in no way impairs the application of the system in its present form.

Categories Used to Describe the FOCUS of a Teacher's Behavior. An emerging theory of human development has been used as a basis for ordering teacher behavior into categories descriptive of the various foci it takes (Schalock, 1967c). The rationale underlying such a tie to developmental theory is straightforward: a teacher, as a primary influence agent, influences the developmental process in many ways. By definition, she influences development when she facilitates learning. She also influences development, however, when she comforts an upset child or loves a child who is badly in need of affection. As a teacher interacts with children during the course of a day she influences many dimensions of human development, not just learning, and any system which attempts to describe a teacher's behavior must be responsive to this wide variety of foci. Toward this end the present system is tied to the broad issues of human development as a means of introducing order as well as practical and theoretical power

into the classification of a teacher's behavior. By so doing it is hoped that the system will have utility beyond the confines of teachers in classrooms teaching subject matter.

Briefly stated, the developmental theory on which the system is based holds that three broad classes of adaptive systems have arisen over the course of the evolutionary history of man, corresponding roughly to 1) the need for internal regulatory mechanisms that lead to the survival and growth of the organism (the regulatory or vital domain), 2) the need for interpersonal-relational systems which lead to the perpetuation and viable social ordering of the species (the interpersonal or generative domain), and 3) the need for competencies which permit the adaptation of the organism to the demands of the external environment (the cognitive or competence domain). Within each of these three major domains the theory holds that three adaptive systems operate, each corresponding roughly to the major sets of adaptive demands that appeared with each benchmark of biological evolution. Thus, as biological evolution progressed, new classes of regulatory or vital mechanisms, new classes of interpersonal or generative relationships and new classes of competencies or commitments were needed in order to meet the demands of increasingly complex organisms in increasingly complex environments. Ultimately, through the constant process of adaptation, viable adaptive subsystems finally became part of the genetic inheritance of man. The three major domains of human development, their adaptive systems, and the evolutionary epochs in which the systems evolved, appear in Table 1.

Paralleling the specification of developmental domains and their respective adaptive systems the theory holds that for each domain and adaptive system there is a corresponding class of influence behaviors which is responsible for its development and maintenance. This proposition stems from the assumption that while all adaptive behavior patterns have a genetic base, all require for their development and maintenance a continuous interchange with relevant dimensions of the external environment, i.e., relevant classes of <u>influence behavior</u>. Three broad classes of influence behavior, corresponding to the three broad domains of human development, have been identified: caretaking, socializing, and teaching. Generally speaking, these are defined as follows:

Caretaking: Those behaviors which lead to the development and maintenance of the <u>regulatory mechanisms</u> involved in the physical, emotional and self-definitional needs of another;

Socializing: Those behaviors which lead to the development and maintenance of the <u>interpersonal orientations</u> involved in the sexual, status and friendship-love relationships of another;

Teaching: Those behaviors which lead to the development and maintenance of the <u>competencies and/or commitments</u> involved in the psychomotor, intellective and attitudinal orientations of another.

Table 1. The adaptive systems of man, ordered according to the nature of the adaptation required and the evolutionary period during which they appeared.

EVOLUTIONARY BENCHMARKS AND EPOCHS	ADAPTIVE SYSTEMS		
	Regulatory or Vital Domain	Interpersonal or Generative Domain	Cognitive or Competence Domain
Benchmark 1: The appearance of life Evolutionary Epoch 1: Organismic evolution	Physical Systems	Sexual Systems	Psychomotor Systems
Benchmark 2: The appearance of chordates Evolutionary Epoch 2: Social evolution	Emotional Systems	Status Systems	Intellectual Systems
Benchmark 3: The appearance of man Evolutionary Epoch 3: Cultural evolution	Identity Systems	Friendship-Love Systems	Attitudinal Systems

Technically, as used within the present framework, influence behavior is defined as behavior which one person directs to another (or group of others) which has as its intent the modification or maintenance of the behavior of another.

As indicated above, it is also proposed that classes of influence behavior exist which correspond to or link with each of the adaptive systems within the three domains of development. At the moment only the subsystems within the teaching domain have been identified, but it is assumed that relatively independent patterns of influence behavior ultimately will be identified for each adaptive system. The three classes of influence behavior within the teaching domain have been labeled, respectively, training, instruction, and enculturation. Operationally, training refers to teaching in the psychomotor area, instruction to teaching in the intellective area and enculturation to teaching in the attitudinal area. The various classes of influence behavior and the adaptive systems which they parallel are listed in Table 2.

Table 2. The adaptive systems of man and the classes of influence behavior responsible for their development and maintenance

ADAPTIVE SYSTEM	CORRESPONDING CLASS OF INFLUENCE BEHAVIOR
Regulatory or Vital Systems	Caretaking Behavior
The Physical System	-
The Emotional System	- (to be identified)
The Identity System	-
Interpersonal or Generative Systems	Socializing Behavior
The Sexual System	-
The Status System	- (to be identified)
The Friendship-Love System	-
Cognitive or Competence Systems	Teaching Behavior
The Psychomotor System	- Training
The Intellective System	- Instruction
The Attitudinal System	- Enculturation

These various classes of influence behavior provide the basic set of categories used in classifying the FOCUS of a teacher's behavior, that is, in identifying where she is directing her attention at any given point in time. Within this set, however, a distinction is made between focal influence behavior (behavior directed specifically to the development and/or maintenance of an adaptive system) and facilitory influence behavior (behavior directed to the management of the environment so that focal influence behavior may be pursued). Operationally, the categories descriptive of classes of influence behavior (see Table 2) serve to describe a teacher's focal influence behavior; a separate set of categories is used to describe facilitory or management influence behavior. Two categories comprise the latter subset: organization (behavior directed to the preparation for or "clean-up" after the pursuit of focal influence), and control (behavior directed to the maintenance of discipline for or order in carrying out focal or organizational activities). In applying the system these behaviors are always recorded in conjunction with the category of focal influence that it is facilitating.

By combining the two category sets in this way it is possible to obtain a much more exacting record of the focus of a teacher's behavior than would be possible if two totally separate category sets were used to describe focal and facilitory behavior.

In addition to the two category sets used to describe the various classes of influence behavior, two supplementary sets are needed to make the system exhaustive of the foci toward which a teacher directs her attention during the course of a day: 1) a set describing attention directed to routine-administrative or "institutional maintenance" matters, e.g., taking attendance, saluting the flag, taking lunch count, handing out notices or papers, and 2) a set describing attention directed to the teacher's personal affairs, e.g., writing a letter, eating, or cleaning fingernails. The category sets involved in describing the FOCUS of a teacher's behavior appear in Figure 4.

In the application of the system to the analysis of a teacher's behavior, the FOCUS analysis is the first to be applied. Operationally, the FOCUS analysis involves either one classification task, if the behavior is not an instance of teaching behavior, or three classification tasks if it is an instance of teaching behavior. The first classification task requires identifying the domain of influence which the behavior represents. The five categories used in this first level analysis are exhaustive so all instances of a teacher's behavior must be classified into one or another of them. If a teacher's behavior is classified as being other than an instance of teaching behavior no further analysis is made of it. If it is classified as an instance of teaching behavior two subsequent analyses are made: 1) specification of the class of teaching behavior it represents (training, instruction, enculturation), and 2) specifying whether it is an instance of focal or facilitory influence. If it is facilitory in nature the observer must then specify whether it has as its focus organization, e.g., "Take out your books"; "Today we're going to study about Rome," or control, e.g., "Speak more softly," "Stop that!" These various decision points are summarized schematically in Figure 5.

	Category Set 1: Focal Influence Behavior			Supplementary Category Sets	
Domains of Influence Behavior	Caretaking Behavior	Socializing Behavior	Teaching Behavior	Category Set 3: Routine-Administration	Category Set 4: Personal Behavior
Classes of Influence Behavior			-Training -Instruction -Enculturation		
Classes of Management Behavior	Organization Control				
	Category Set 2: Facilitory Influence Behavior				

Figure 4. Category sets involved in describing the FOCUS of a teacher's behavior.

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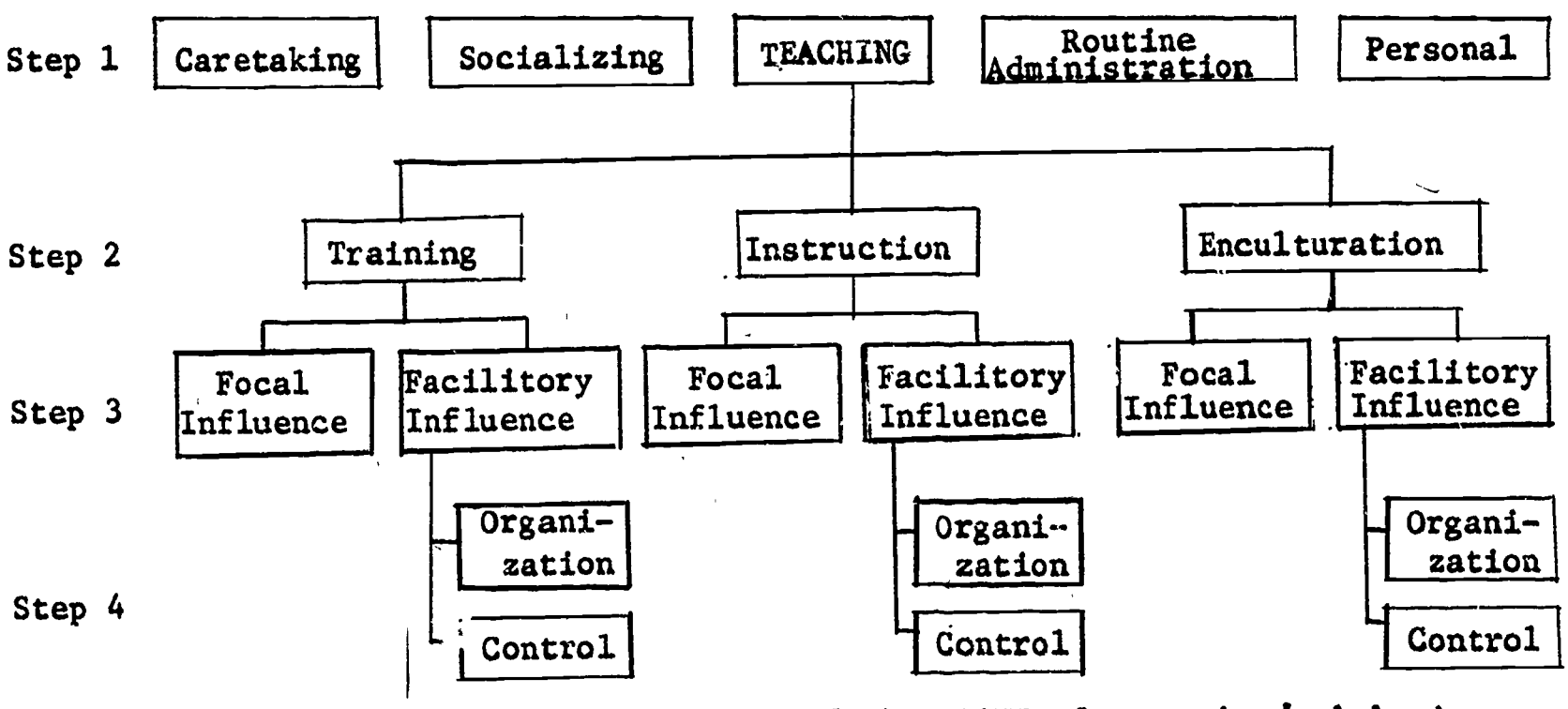

Figure 5. Steps in the classification of the FOCUS of a teacher's behavior.

Conceptually, the relationship between the various category sets descriptive of the foci (tasks) of a teacher may be clarified by thinking of them in terms of an arrow model. In such a model the shaft of the arrow represents the various focal influence behaviors, the head of the arrow represents the developmental outcome toward which a focal influence is directed, the vanes of the arrow represent the facilitory influence behaviors which a teacher brings to a task (her pre-instructional preparations) and a tier of continuously cycling air waves around the shaft of the arrow represents the various facilitory influence behaviors which a teacher must keep bringing to a situation in order to pursue the focal influence that she desires. Routine administrative and personal maintenance behaviors are included in this latter tier of events. Such a model appears schematically as Figure 6.

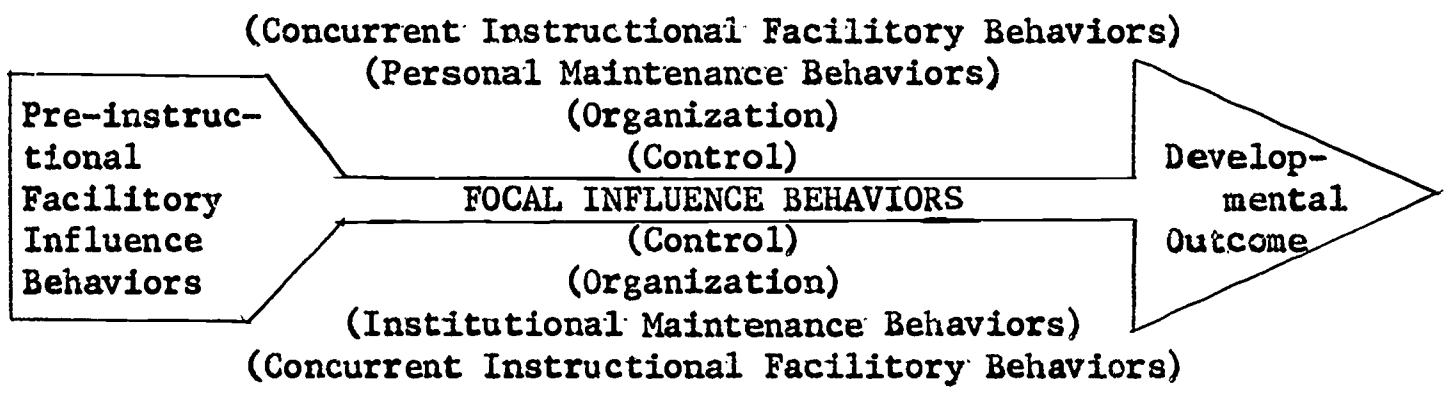

Figure 6. A schematic representation of the functional relationship between the various category sets used in the FOCUS analysis.

Categories used to describe the OPERATIONS used by a teacher. Whenever a teacher's behavior is classified in the FOCUS analysis as being an instance of teaching behavior, a number of additional analyses are brought to it. Some of these have been reviewed already (see above). Another entire set of analyses, described under the general heading of TEACHING OPERATIONS analyses, is also applied.

As implied earlier the TEACHING OPERATIONS analysis derives from the traditional literature on learning and the concern in education with "how" or the method by which a thing is taught. The rationale underlying such an analysis is straightforward: by definition, the teacher is a manipulator of the conditions of learning, and in order to manipulate effectively she must relate what she does (operations, methods) to what is to be learned and how it can best be learned. The aim of the OPERATIONS analysis is to provide a detailed description of that which a teacher does in performing the teaching function. It is assumed, though it has not as yet been demonstrated, that the category sets within the OPERATIONS analysis will be applicable across ages and settings, and will be appropriate to the development of all levels of cognitive outcomes, i.e., associations, discriminations, concepts, principles, etc.

Toward this end both a functional and a structural analysis is made of each instance of teaching behavior. Two related (nested) sets of categories are used in each of these analyses, a set of "component" and a set of "function" categories in the functional analysis and a set of "tactic" and a set of "move" categories in the structural analysis. In combination these provide a totally nested, four level analysis of a teaching act in terms of the TEACHING OPERATION it represents. This is illustrated schematically in Figure 7. Each category set used in the overall analysis is described separately in the pages which follow. In reviewing these category sets it should be recalled that all category sets in the FOCUS and OPERATIONS analyses are committed to memory by an observer and are applied to each instance of teaching behavior (each message) as it occurs in real time!

CATEGORIES DESCRIPTIVE OF THE TEACHING COMPONENT BEING USED. An analysis of the literature on instruction suggests that all instances of teaching behavior can be classified into one of three gross operations: 1) exposing the learner to information, 2) precipitating performance on the part of a learner, and 3) providing feedback to the learner about his performance, either in the form of positive or negative evaluation (feedback, of course, is only a special class of information giving). An analysis of the literature on learning suggests a parallel set of operations: to learn a child must 1) encounter and process information, 2) test whether he has control over the information, i.e., whether he can identify, abstract from or use the information by performing in relation to it, and 3) receive feedback as to the nature or extent of the control that he has. This is the case whether a child is engaged in self-guided or teacher-guided learning.

As a consequence of this analysis a set of categories paralleling these three operations have been established for use as a first level analysis of TEACHING OPERATIONS. Arbitrarily this has been labeled the component analysis. Generally speaking, the three categories that make up the set are defined as follows:

Exposure to Information:	Any message which appears to have as its aim the extension of knowledge, awareness, understanding, skill, etc., and which does not have qualities that would lead to its being classified as evaluation of performance. Broadly speaking, messages of this kind take the form of either "talking" or "showing." Examples include telling a class or child what is planned for the day, reading a story, explaining how to work a math problem, illustrating through slides or a picture that which is being discussed, and demonstrating how a particular process works or movement takes place.
Precipitation of Performance:	Any message which appears to have as its aim the initiation of overt behavior on the part of a child or children. Broadly speaking, messages of this kind take the form of either a demand or an inquiry. Examples include questions requiring an immediate answer, directions to ready mater-

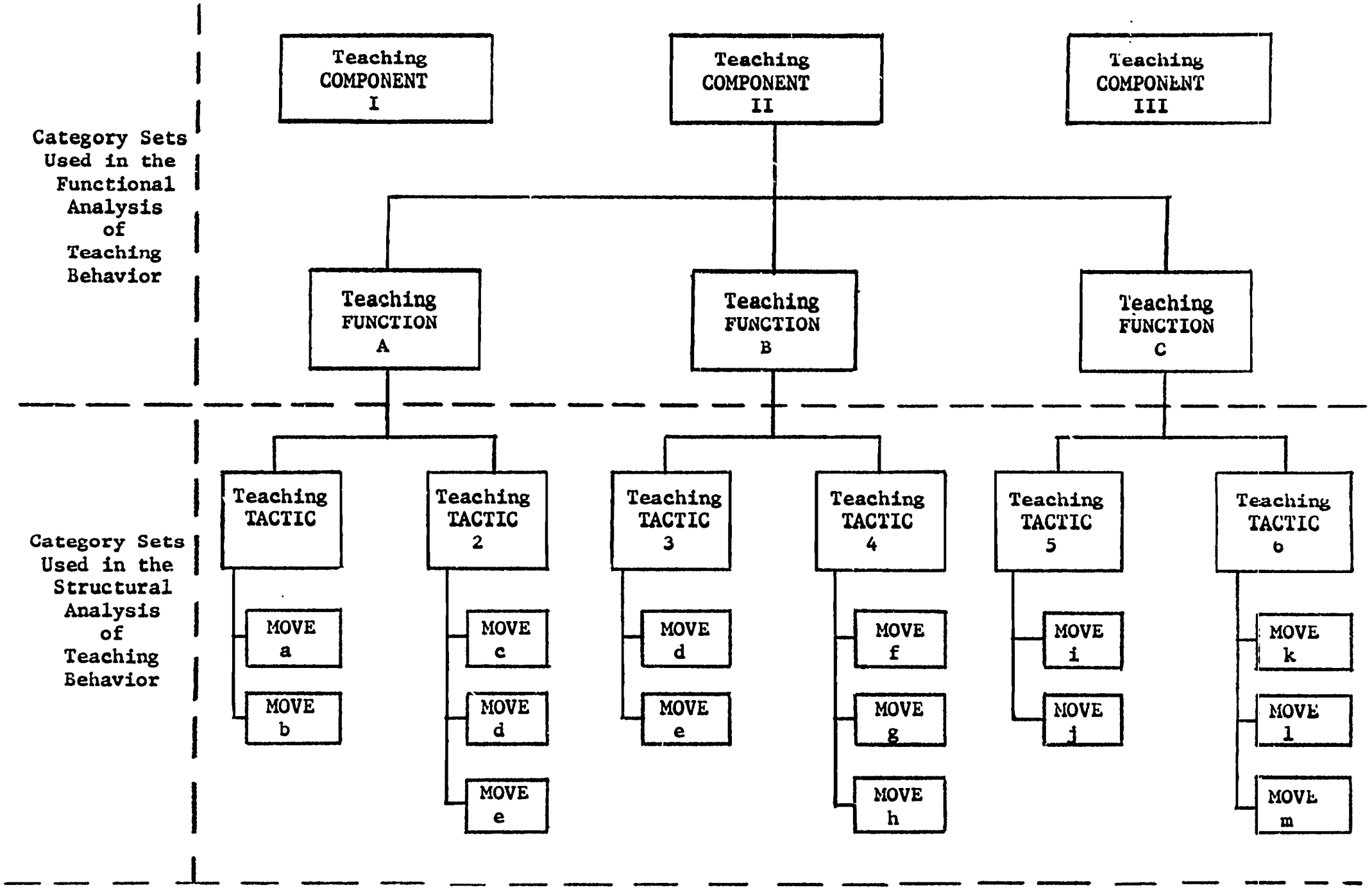

Figure 7. A schematic representation of the nested, four level analysis of TEACHING OPERATIONS.

ials for a lesson, excusing children for recess, and starting children to work in their workbooks, to read, or to take an examination.

Evaluation of Performance: Any message which appears to have as its aim the conveyance of the rightness or wrongness, goodness or badness, appropriateness or unappropriateness of a behavioral act (which may or may not have been precipitated by the teacher). Broadly speaking, messages of this kind take the form of praise or censorship; rewards or punishment. Examples include comments such as "Fine"; "Well done"; "That is correct"; "That is incorrect"; "Wrong"; "Shhh"; "Stop that"; "Sit down, Beth. You're bothering your neighbor!"; and nonverbal actions such as a pat on the back (in praise), a finger to the lips to indicate quiet, a gold star, a finger pointed critically at a child who is creating a disturbance, a raised hand in the form of a threat.

CATEGORIES DESCRIPTIVE OF THE TEACHING FUNCTION BEING SERVED. Upon analysis it is clear that each of the various components of instruction may serve quite different functions within the instructional process. For example, exposure to information may serve to structure that which is to occur during the course of the period or day, guide the learner to the next step in the solution of a problem, provide closure to or a solution for a problem, etc. Similarly, performance may be precipitated in order to monitor that which a child knows, guide a subsequent response, or get a child to apply that which he already knows. So too with evaluation: it may serve either a positive or negative function, that is, it may serve to increase or decrease the probability of a similar behavior occurring in the future.

With this kind of thinking as background, a category set has been developed for use in the system which describes the various functions to which the three components of teaching can be put. This we have labeled the functions analysis. In combination, the components and functions analyses constitute the over-all "functional" analysis provided by the system (see Figure 7). The categories used in the functions analysis appear in Table 3.

CATEGORIES DESCRIPTIVE OF THE TEACHING TACTIC BEING USED. As indicated earlier, the TR system provides for both a functional and structural analysis of teaching behavior. Operationally this means that subsequent to the two functional analyses just reviewed, an instance of teaching behavior is then submitted to an analysis of its structural properties. As with the functional analyses, this involves two levels of analysis: 1) the teaching tactic that it represents, and 2) the teaching move that it represents. Conceptually, both tactics and moves refer to how messages are transmitted, or the form in which they are transmitted, with tactics simply being the more generic class of the two.

Table 3. Categories used in OPERATIONS analysis 2: A description of the Teaching Functions each component serves.

Functions served by Exposure to Information	Functions served by Precipitation of Performance	Functions served by the Evaluation of Performance
1. Structures	1. Monitors	1. Positive Reinforcement
2. Guides	2. Guides	2. Negative Reinforcement
3. Provides Closure and/or Solutions	3. Demands Application	
4. Reviews and/or Summarizes		

In terms of the four-level, nested organization of the OPERATIONS analyses tactics appear as the third level of analysis (see Figure 7). Operationally, this means that the tactics analysis follows immediately after the functions analysis, and provides a description of how the various functions served by a component of teaching behavior are transmitted or conveyed to a learner. Conceptually, tactics are specific to components, that is, one subset of tactics serves all four functions within the exposure to information component, another subset serves the three functions within the precipitation of performance component and still another subset serves the two functions within the evaluation component. The three subsets of tactics, ordered according to the components they serve, are summarized in Table 4.

Table 4. Categories used in OPERATIONS analysis 3: A description of the Tactics used in the performance of teaching functions.

Tactics Used In Exposing to Information	Tactics Used In Precipitating Performance	Tactics Used In Evaluating Performance
1. Exposition	1. Inquiry	1. Signals
2. Illustration	2. Direction	2. Words
3. Demonstration		3. Objects

CATEGORIES DESCRIPTIVE OF THE TEACHING MOVE BEING USED. As indicated above, the analysis of teaching moves also deals with how a teaching function is performed. In this sense it is similar to the tactics analysis just described. It differs, however, in that it describes how each tactic is performed, just as tactics describe how each function is performed. In combination, the tactic and move analyses constitute the over-all "structural" analysis of teaching behavior that is provided by the system.

Operationally, the move analysis constitutes the fourth and last level of OPERATIONS analysis (see Figure 7). Conceptually, teaching moves are specific to tactics, that is, one subset of moves serves the Exposition tactic, another subset the Illustration tactic, another the Inquiry tactic, and so forth. This is the case regardless of the function that the tactic is serving. Thus, for example, the same moves are used to describe the form which Exposition takes when it is used to Structure, Guide, Provide Closure or Review or Summarize. In this sense moves, like tactics and functions, are specific to the various components of teaching behavior. Table 5 contains a summary of the various subsets of moves that are used in the system.

COMBINING ELEMENTS OF TEACHING OPERATIONS: THE CONCEPT OF TEACHING STRATEGIES. In combination, the various category sets used in analyzing teaching OPERATIONS provide a relatively exhaustive description of the elements of teaching behavior. From the point of view underlying the development of the system this capability is essential to productive research on teaching. In and of itself, however, it is not sufficient. Procedures must be developed which permit the combining of various elements of teaching behavior into sequential patterns or strategies which can then be tested empirically for their contribution to the development of specific learning outcomes in children. This says, in effect, that while an analysis of the elements of teaching behavior is a necessary first step in understanding the significant in teaching, it is not an end in itself. Rather, it is the means to an end, with the end clearly being the combination of elements into sequential patterns that are productive of specified learner outcomes.

Two tasks must be accomplished before this end can be realized: 1) the conceptualization and operational definition of relevant teaching strategies, and 2) the development of a computer based system for ordering the mass of data that comes from and is needed in such an approach. At the moment, neither task has been completed, but both are being pursued. At the conceptual level "expository" strategies are being operationalized for the teaching of concepts, "discovery" strategies for the teaching of principles, and "discipline" strategies for the maintenance of classroom control. Considering all possible combinations of crossover between components, between functions within components, between tactics within functions within components, etc., the potential of the present system as a base for the development and operationalization of teaching strategies is essentially unlimited.

Table 5. Categories used in OPERATIONS analysis 4: A description of the moves used in the execution of teaching tactics (by components)

- **Exposure to Information**
  - **The Tactic of Exposition**
    - Describe that which is being considered
    - Conceptualize that which...
    - Explain that which...
    - Evaluate that which...
  - **The Tactic of Illustration**
    - Provide positive examples of the object or event being considered
    - Provide negative examples of the...
    - Provide an abstract model of the...
    - Provide a pictorial model of the...
    - Provide a representative model of the...
    - Provide a real-life model of the...
  - **The Tactic of Demonstration**
    - Present a laboratory or simulated demonstration of the principle or process being considered
    - Present a real-life demonstration of...

- **Precipitation of Performance**
  - **Inquiry**
    - Conditional Q's
    - Verification Q's
    - Relational Q's
    - Implication Q's
  - **Direction**
    - By suggestion
    - Straightforward, accompanied by a cushion
    - Straightforward, accompanied by an explanation
    - Straightforward and without qualification

- **Evaluation of Performance**
  - **Signals**
    - Tending
    - Low power signals
    - High power signals
  - **Words**
    - By suggestion
    - Straightforward, accompanied by a cushion
    - Straightforward, accompanied by an explanation
    - Straightforward and without qualification
  - **Objects**
    - Low power objects
    - High power objects

The development of a computer based system for ordering the data sequentially is essential to the study of teaching strategies. As the system is used at the moment, that is, in describing only the elements of teaching, it requires approximately two hours to hand tabulate the data that derive from an hour's observation into simple category frequency counts. Combining categories and preparing complex ratio measures from them requires another half hour to 45 minutes, depending upon the number of such measures desired. Relating teacher behavior to child behavior sequentially, that is, analyzing for patterns in teacher-child response chains, or analyzing teacher behavior in terms of patterns (strategies) is simply beyond the capability and economic feasibility of hand tabulation. In developing a computer based data reduction system, two plans are being explored: 1) continue to record by hand but transfer the records to IBM cards or computer compatible tape systems for data reduction, or 2) initiate a mechanical recording procedure whereby the observation is recorded initially on computer compatible tape. It may be that in the end both systems will be used, the hand recording-transfer system in the live classroom observations and the mechanical system in the analysis of audio or audio-video tapes.

Categories used to describe the AFFECTIVE QUALITIES of a teacher's behavior. In addition to analyzing each instance of teaching behavior in terms of its FOCUS and the TEACHING OPERATION it represents, it is also possible to describe its AFFECTIVE QUALITIES, that is, the warmth, exuberance, anger, hostility, anxiety, upset, etc. which accompany it. This is the dimension of teaching behavior that is of special interest to those interested in the mental health or mental hygiene aspect of teaching, and grows directly out of the work in classroom "climates." In a sense, the categories descriptive of AFFECT serve as modifiers of the FOCUS and OPERATIONS categories.

Two category sets are used to describe AFFECT: 1) the intensity or "loudness" of an interact relative to the general noise level of the classroom, and 2) the emotional qualities that accompany it. Both category sets appear in Table 6. Operationally, both sets of categories accompany the recording of the FOCUS and OPERATIONS categories, appearing as relatively simple, straightforward notations as to the existence or nonexistence of the qualifying characteristics. While this adds considerably to the classification-discrimination task of an observer, the recording load is reduced by recording only those modifiers represented by categories other than zero (0) (see Table 6). Practically, this means that the large bulk of primary category entries do not involve an AFFECT notation since only a small proportion of a teacher's behavior at home or in the classroom involves high levels of intensity or emotionality. While the significance of these qualitative characteristics or qualities are unknown from an empirical point of view, they are obvious components of a teacher's behavior and need therefore to be included in a system that attempts to be exhaustive in its description of teacher behavior.

Table 6. Category sets used in describing the AFFECTIVE QUALITIES that accompany teaching behavior.

Intensity		Emotional Qualities					
		Warmth, Interest, Exuberance		Distance, Aloofness		Upset, Concern	
Symbol	Definition	Symbol	Definition	Symbol	Definition	Symbol	Definition
0	Equivalent to the general "noise level" of the classroom and/or not unusual for the particular teacher being observed	0	Equivalent to that which typifies the behavior of the teacher that is being observed	0	Equivalent to that which typifies the behavior of the teacher that is being observed	0	Equivalent to that which typifies the behavior of the teacher that is being observed
1	Somewhat above the general pitch of the classroom and/or above that generally used by the teacher	+	Somewhat more positive feeling than is reflected ordinarily by the teacher that is being observed	-	Somewhat more negative feeling than is reflected ordinarily by the teacher that is being observed	✓	Somewhat more upset than is reflected ordinarily by the teacher that is being observed
2	Far above the general pitch of the room &/or above that which is used generally by the teacher being observed	++	Far more positive feeling than is reflected ordinarily by the teacher that is being observed	--	Far more negative feeling than is reflected ordinarily by the teacher that is being observed	✓✓	Far more upset than is reflected ordinarily by the teacher that is being observed

Categories used to describe the CONTENT of a teacher's behavior. As indicated earlier a complete analysis of teaching behavior must include a description of the CONTENT of that which is said, as well as its FOCUS, AFFECTIVE qualities, and OPERATIONAL qualities. Also as indicated earlier, the TR System as it presently stands provides for the analysis of CONTENT through audio or video-tape recordings, but functional category sets to be used in the analysis are not as yet a part of the system. Moreover, there is no plan to make them a part of the system within the foreseeable future. Category sets for two "content related" analyses are under development, an analysis of the convergent-divergent nature of the educational outcomes being pursued and an analysis of the cognitive processes being exercised by a learner, but even these are some months away from completion. This relative lack of attention in the present system to CONTENT is not meant to imply that a procedure for its analysis is any less significant or less urgently needed than any other analysis that has been developed. Its exclusion has simply been a consequence of limitations of time, energy, interests, and the availability of a data base from which to move. It is probable, however, that until curriculum specialists or discipline specialists complete the task of analyzing the "structure" of their respective disciplines, a system for analyzing the CONTENT of a teacher's behavior will be relatively limited.

Dimensions of Learner Behavior Described by the System

Learner behavior is recorded in the system in the same way that teacher behavior is recorded, namely, in categories descriptive of the messages that a learner directs to the teacher or to other learners. In this respect, the description of learner behavior calls for the utilization of category sets in precisely the same way that they are used in the description of teacher behavior, and all of the conceptual and methodological problems involved in the former are involved in the latter.

In the present system, however, most of these problems have been short-circuited by: 1) applying the same conceptual framework to the analysis of learner behavior that is applied to teacher behavior, and 2) limiting the analysis of learner behavior to its FOCUS and AFFECTIVE QUALITIES. An OPERATIONS analysis (using the TR System as it now stands) and a CONTENT analysis would be equally appropriate, but the demands that have been placed upon the system thus far have required that only the FOCUS and AFFECT analyses be used. For this reason, the adaptation of the system to the behavior of learners will be described for these two analyses only.

Categories used to describe the FOCUS of a learner's behavior. In general, the same categories used to describe the FOCUS of a teacher's behavior are used to describe the FOCUS of a learner's behavior. The rationale for such a procedure is straightforward: the theory of human development on which the focus analysis is based has as much relevance

to the ordering of a child's behavior as it does a teacher's. Inherent in the theory is the notion that 1) all adaptive systems are operative throughout the life of an individual, and 2) all behavior on the part of an individual has as its focus the adaptive function of one or more adaptive system. As a consequence, the theoretical framework is as applicable to the task of ordering child behavior and attention as it is teacher behavior.

Two modifications are made in the FOCUS categories when they are applied to learner behavior: 1) the adaptive system label, rather than its corresponding class of influence behavior, is used to describe the learner's behavior (see Table 2), and 2) all six adaptive subsystems within the vital and social domains (see Table 1) are used to describe a learner's behavior. This sharpening of the FOCUS categories in describing learner behavior is justified on the basis of the relatively large proportion of time young learners focus in these two domains. The differentiation between focal and facilitory behaviors, and the Routine-Administrative Category (see Table 3) are used in the analysis of the FOCUS of a learner's behavior. Some examples of the kinds of behaviors that are classified in each of the ten subsystems descriptive of the FOCUS of a learner's behavior are listed in Table 7. Representative developmental outcomes that are thought to derive from effective adaptive system functioning are listed in Table 8.

Categories used to describe the AFFECTIVE QUALITIES of a learner's behavior. As in the case of a teacher's behavior category sets descriptive of the AFFECTIVE QUALITIES of a learner's behavior also are recorded when appropriate. These are exactly the same as those used in describing a teacher's behavior (see Table 6).

Additional MODIFIERS descriptive of a learner's behavior. In addition to the recording of affect, several additional modifiers specific to the description of learner behavior within the classroom setting are included in the system. The need for these additional modifiers stems in part from the gross nature of the classification given learner's behavior and in part from the qualitatively different features of learner and teacher behavior because of the different rolls and tasks assumed. The additional modifiers applied to learner behavior are listed in Table 9. As with the use of affective ratings, the modifying categories are recorded immediately after the categories descriptive of the adaptive system in which the child's behavior is focused.

Dimensions of the Setting Described by the System

One dimension of context which shapes teaching behavior is learner behavior. Another is the setting within which both teacher and learner behavior occur. In work done thus far seven dimensions of a classroom setting have been identified: (1) the subject matter and the activity that is being pursued, (2) the organization of the classroom, for example, small study groups, individuals around a large

Table 7. Categories used to describe the FOCUS of a learner's behavior.

Behaviors Relating to Physical Development	Ex: eating, resting, sleeping, dressing, exercising, injury
Behaviors Relating to Emotional Development	Ex: crying, fearfulness, upset over frustration
Behaviors Relating to Identity Development	Ex: boastfulness, personal negation, defensiveness, self-evaluation, self-criticism, maliciousness
Behaviors Relating to Sexual Development	Ex: discussions of or reference to reproduction or sexuality, exploration of sexual organs
Behaviors Relating to Status Development	Ex: fighting, competition, testing, threatening
Behaviors Relating to Relational Development	Ex: chit-chat with a neighbor, putting one's arms around a friend, telling another how much he is liked or loved
Behaviors Relating to Psychomotor Development	Ex: skipping, running, jumping, playing ball, throwing darts, operating a yo-yo
Behaviors Relating to Intellectual Development	Ex: all that which relates to the mastery of knowledge and/or intellectual skill
Behaviors Relating to Attitudinal Development	Ex: all that which relates to the development of values, attitudes, beliefs, commitments
Behaviors Relating to Routine-Administrative Matters	Ex: roll count, flag salute, sharpening of pencils, going to the bathroom

Table 8. Representative developmental outcomes, ordered according to the adaptive systems they serve*

The Regulatory or Vital Domain	The Interpersonal or Generative Domain	The Cognitive or Competence Domain
(Physical Systems)	(Sexual Systems)	(Psychomotor Systems)
Energy	Acceptance of sexuality and related body functions	Walking
Physical well-being	Adoption of sex-linked roles and behavior	Writing
Sensory acuity	Ability to experience sexual excitement and enjoy sexual intimacy	Swimming
(Emotional Systems)	(Status Systems)	(Intellective Systems)
Feeling acuity	Ability to display situationally appropriate agressiveness	Mastery of a subject area
Freedom from emotions which cripple	Viable orientation to authority	Skill in problem solving
Preponderance of emotions which liberate	Ability to display situationally appropriate leadership	Ability to make and follow long-range plans
(Identity Systems)	(Friendship-Love Systems)	(Attitudinal Systems)
Acceptance of self	Sensitivity to the feelings/needs of others	Attitudes
Clarity in one's commitments and directions	Considerateness for the feelings/needs of others	Values
Clarity in one's relationship to the cosmos	Trust of others	Beliefs

* The developmental outcomes listed in the table are extremely broad, reflecting only the apex of a heirarchy of related developmental outcomes.

Table 9. Modifiers specific to child behaviors

Category Set	Symbol	Definition
Involvement in Instruction	v	Verbal
	n	Non-verbal
	Λ	Hand-in-the-air
	t	Listening to or looking at the teacher
	-?-	Unable to respond when performance is demanded
Focus and Appropriateness	Δ	Focus shared with teacher, but behavior inappropriate
	0	Focus not that of the teacher

work table, individuals at their desks, (3) the number of learners in the classroom, (4) the general characteristics of the learners in the classroom, for example, their personality characteristics, their capabilities, age, and sex, (5) the physical characteristics of the classroom, for example, the space available per learner, the presence of individual desks or tables, heat, ventilation, lighting, the proximity to activity on the playground or in the halls, (6) the philosophy of the school administration, particularly the building principal, in relation to classroom activity, and (7) unplanned events which are disruptive to planned learning experiences, for example, a fire drill, an unanticipated visitor, a child becoming ill, building repair or workmen's activity nearby. The present system makes provision for the assessment of all these situational factors. Two of them, the subject matter and activity in which the class is involved, and the organization of the classroom, are described in connection with and at the same time that the teacher and learner behavior are described; that is, they are part of the observation system (see Figure 2). A diary record of the unusual or unplanned events that occur during the day on which the observations are made is kept by the teacher. All of the other setting measures, that is, the number of children in the class and their characteristics, the physical characteristics of the classroom, and the philosophy of the school administration in relation to the activities that

take place in the classroom, are obtained through interview, either prior to or subsequent to the observation. In the paragraphs which follow each of the situational measures are described briefly.

Subject Matter, Activity, and Classroom Organization. The subject matter in which a class is involved, the activity being pursued within that subject matter, and the classroom organization that accompanies it are described in diary record form on the observation sheet that is used in recording the teacher-learner interaction (see Figure 2). Each observation begins with a notation as to subject matter, activity, and classroom organization, and these notations continue opposite the recording of the interaction that is occurring throughout the observation period. Time also is noted so that it becomes possible to identify the length of time spent within any given activity, classroom organization, etc. By including time, activity, classroom organization and subject matter in the observation record it is possible to analyze teacher-learner interaction against any or all of these factors.

Number and Characteristics of Children in a Classroom, the Physical Characteristics of a Classroom, and the Philosophy of the School Administration Toward Conduct in the Classroom. As indicated above, information on these variables is obtained through interview with the teacher. The specific items in the interview schedule are listed in Table 10. The items included in the schedule were identified by elementary school teachers as factors which frequently and significantly influence that which occurs within their classrooms. Since the titles of the factors are self-explanatory, no further comment will be made about them. The interview is usually administered after the observation has been completed so as to obtain information on the number of children absent during the observation, but it may be administered before the observation if so desired. Also, the interview schedule, in the form of a questionnaire, may be given to the teacher to complete by herself.

Unanticipated Events. One of the setting factors identified by teachers which often influences teacher-learner interaction is that of unanticipated events. These can range from a sudden snow storm or an unanticipated assembly to a child becoming ill or a stray dog finding his way into the room. By definition, an unusual event is one which interferes with that which is planned in relation to instruction. In order to obtain information as to the nature and occurrence of these events each teacher that is observed is asked to record at the end of the observation period any unanticipated events which occurred either prior to or during the time of observation that in her opinion had a significant influence upon that which occurred during the course of the observation. The recording form that is provided the teacher for this purpose appears as Figure 8.

Table 10. Items making up the interview schedule around setting factors which influence behavior of teachers and learners

CLASSROOM RELATED FACTORS		SYSTEM RELATED FACTORS
Physical Features of the Classroom	Characteristics of the Class	
1. Size of room in relation to size of class. a) square footage b) teacher's feelings about adequacy of space 2. Seating arrangements in the room, i.e., tables and chairs vs. desks, etc. (Describe.) 3. Facilities for toilet and drinking (if present, describe.) 4. Susceptibility of room to noise and student traffic. (Teacher's estimate; if susceptible, have teacher describe the nature and/or amount.) 5. Availability of educational materials, teaching aids, etc. in the room. (Teacher's estimate of adequacy.)	1. No. of students in the class, plus the no. absent on day of observation 2. Boy-girl ratio 3. No. of exceptional children in the class, e.g., intellectually, physically and emotionally handicapped, intellectually superior, etc. (List no. by class of exceptionality.) 4. The no. of children who are habitually disruptive of the class, plus no. absent on days of observation. (Obtain from teacher's records.) 5. Principal's estimate of the socio-economic status of the families served by the school. (Provide one of three estimates: predominantly lower SEC, predominantly middle and/or upper middle SEC; fairly even cross-cutting of the lower and middle SEC) 6. Principal's estimate of the mobility of the student's families. Provide one of three estimates: a high proportion mobile, e.g., service or migrant worker families; a high proportion permanent residents; a fairly even distribution of mobile and permanent residents.)	1. Official policy toward classroom discipline and control a) Policy toward noise in the classroom. (Describe; obtain through teacher.) b) Policy toward the handling of "discipline problems" by teachers. (Describe; obtain through teacher.) 2. Classroom organization, e.g., self-contained, cooperative or non-graded, team teaching, etc.(Describe; obtain through teacher.) 3. Curricular innovations, e.g., the "new math," experimental biology courses, etc. (Describe; obtain through teacher.)

TEACHER_____

GRADE LEVEL_____

OBSERVATION DAY (circle day) 1 2 3

DATE_____

It is well known by teachers that factors such as the temperature or ventilation of a classroom, the physical well-being of children, the anticipation of a special event or holiday, the appearance of an invited or uninvited animal, the occurrence of a fire or a construction project nearby, or the well-being of the teacher herself can have a marked effect upon behavior occurring within the classroom. Since our research requires as "natural" a picture as possible of classroom behavior, would you please describe below any circumstances that you feel may have caused the behavior observed in your classroom to be different from that which usually occurs.

If unusual events did occur, would you indicate also the approximate time that they occurred.

The examples of unusual events cited above are, of course, only suggestive of the wide range of events which can affect a classroom. When you are thinking about that which may have affected behavior in your own classroom please feel free to include anything and everything that may have made it an "unusual" situation.

The observer will pick this record up from you at the close of the last observation period on each observation day.

Figure 8. The form for recording unusual events which affected or could have affected behavior in the classroom during the time of observation.

THE UTILITY OF THE SYSTEM

Evidence of the utility of the system comes from several sources: 1) the reliability of observers with the system (on individual categories, complex categories or ratio measures and interaction patterns) in both the face-to-face and the tape or video-tape observation situations, 2) the independence of the complex (ratio) measures that are derived from the category frequency data, 3) the predictive validity of these measures, and 4) the power of the various measures that derive from the system in discriminating (in terms of profiles) between teachers and for a given teacher between subject matter areas. The reliability of observers with the system is guaranteed by insisting upon training with the system to the point of criterion. For categories with large frequencies (100 or more per half hour of observation) 90 per cent agreement between two or more independent observers on individual category assignment and interaction pattern recording is required. For categories with middle-range frequencies (30 to 100 per half four of observation) an 85 per cent agreement is required, and for categories of low frequency (6 to 30 per half hour of observation) 80 per cent agreement is required. Formal percent agreement measures between observers are not calculated for categories which appear fewer than 6 times per half hour of observation. With the completion of the training manual and exercises (Schalock, Micek & Weigel, 1967), including pre-coded training films, it is anticipated that reliability will be able to be established with the system, using naive observers, with one month's training.

The independence and the predictive validity of the complex ratio measures that have been derived from the system have been demonstrated twice (Schalock, Beaird, and Simmons, 1964) (Schalock and Beaird, 1967). In each study the inter-correlations between these measures was near zero and the R^2 value of a series of independent predictors in relation to these measures, i.e., the measures derived from the system served as that which was to be predicted, ranged from .55 to .89. Behavior profiles that have been developed for both student and experienced teachers, and for a given tacher in different subject areas, consistently reflect differences, indicating that the measures derived from the system are relatively sensitive. While normative data have not as yet been collected, plans are underway for doing so.

In summary, the TR System provides a reliable, usable research instrument for describing teaching behavior within a wide variety of contexts. While it is not an exhaustive measure, for example, it does not provide a description of the CONTENT of a teacher's behavior, it is relatively exhaustive as measures of teaching behavior go. Also, it is soundly based empirically and conceptually. Undoubtedly subsequent work with the system will lead to its modification, but at the moment it fairly well represents the elements of teaching which are known to relate to the learning process. If nothing else, the System represents a reasonable point from which to begin serious study of one of the most significant but least understood phenomena of our time.

BIBLIOGRAPHY

Aschner, Mary Jane McCue. The analysis of verbal interaction in the classroom. In A. A. Bellack (Ed.) Theory and Research in Teaching. New York: Teachers College, Columbia University, 1963, pp. 53-78.

Bales, R. F. Interaction Process Analysis. Cambridge: Addison-Wesley, 1950.

Bellack, A. A., and Davitz, J. R., in collaboration with Kliebard, H. M., and Hyman, R. T. The language of the classroom: meanings communicated in high school teaching. Part I. U. S. Office of Education, Cooperative Research Project No. 2023. New York: Institute of Psychological Research, Teacher's College, Columbia University, 1963.

Bellack, A. A., in collaboration with Hyman, R. T., Smith, Frank L., Jr., and Kliebard, H. M. The language of the classroom: meanings communicated in high school teaching. Part II. U. S. Office of Education, Cooperative Research Project No. 2023. New York: Institute of Psychological Research, Teacher's College, Columbia University, 1965.

Bishop, Barbara M. A study of mother-child interaction. Psychol. Monogr., 1951 No. 11 (Whole No. 328).

Flanders, N. A. Teacher influence, pupil attitudes, and achievement. U. S. Office of Education, Cooperative Research Project No. 397. Minneapolis: University of Minnesota, 1960. Mimeographed.

Hughes, Marie, and Associates. A research report: Assessment of the quality of teaching in elementary schools. Salt Lake City: University of Utah Press, 1959.

Moustakas, C. E., Sigel, I. E., and Schalock, H. D. An objective method for the study of adult-child interaction. Child Development., 1956, 27: 109-134.

Openshaw, M. K. and Cyphert, F. R. A research report: Development of a taxonomy for the classification of teacher classroom behavior. Columbus, Ohio: Ohio State University, College of Education, 1967.

Schalock, H. Del. Issues in the conceptualization and measurement of teaching behavior. Paper read at the AERA meetings in New York, 1967. Mimeographed.

Schalock, H. Del. The Conceptualization and Measurement of Teaching Behavior, 1967b. A monograph in preparation.

Schalock, H. Del. Evolution, Experience, and Adaptive Systems: An Emerging Theory of Human Development. In preparation (1967c).

Schalock, H. D. and Beaird, J. H. Increasing prediction of teacher's classroom behavior through use of motion picture tests. U. S. Office of Education supported research in progress. Cooperative Research Project No. 5-4836.

Schalock, H. D., Beaird, J. H., and Simmons, Helen. Motion pictures as test stimuli: An application of new media to the prediction of complex behavior. 1964, U. S. Office of Education, Title VII Project No. 971. Monmouth, Oregon: Teaching Research Division, Oregon State System of Higher Education.

Schalock, H. D., Micek, S., and Weigel, V. The TEACHING RESEARCH System for Describing Teaching Behavior In Context: A Training Manual.

Schalock, H. D. and O'Neill, P. J. A reconceptualization of parent behavior. Research completed for the National Institute of Mental Health, U.S.P.H., Grant #M-3636(A). 1960.

Smith, B. O. and others. A tentative report on the strategies of teaching. U. S. Office of Education Cooperative Research Project No. 1640. Urbana: Bureau of Educational Research, College of Education, University of Illinois, 1964.

Suchman, J. R. The elementary school training program in scientific inquiry. U. S. Office of Education Title VII, Project No. 21. Urbana, Illinois: University of Illinois, June, 1962.

Taba, Hilda, Levine, S., and Elzey, F. F. Thinking in elementary school children. U. S. Office of Education, Cooperative Research Project No. 1574. San Francisco State College, 1964.