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Pupil assessment of elementary classroom teaching behavior : a study of atypical ratings.

David Hoyle Lepard
University of Massachusetts Amherst

PUPIL ASSESSMENT OF ELEMENTARY CLASSROOM TEACHING BEHAVIOR: A STUDY OF ATYPICAL RATINGS

A Dissertation Presented

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DAVID H. LEPARD

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Approved as to style and content by:

(Chairman of Committee)

(Head of Department)

(Member)

(Member)

(Member)

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CHAPTER I

NATURE AND SCOPE OF THE PROBLEM

Introduction

Abundant research has indicated that factors of both heredity and enviroment enter into all behavior. Focusing on enviromental determinants of behavior, Anastasi (1958) differentiated between two principle classes of influence which she labeled organic and behavioral. The behavioral class of enviromental influence is, by definition, the most direct and measurable. To the extent that it is more direct, human behavior is often explained in terms of the equation B = F (P, E); namely that behavior (B) is a function (F) of the interaction of the person (P) and his enviroment (E) (Jones, 1968).

The comprehensive and longitudinal works of Sheldon and Eleanor Glueck (1959, 1962) have empirically established both the immediate and long-term predictive influences of the home as one aspect of the enviroment. Using the Glueck Social Prediction Table, which they developed at Harvard University, the authors were able to make a ten-year projection as to the future delinquent or nondelinquent behavior of 300 six-year-old males. The results were reported to be 85 percent accurate (Craig and Glick, 1964).

Since the average child spends so much of his time in relatively formal instructional settings, it would seem that the school enviroment as well as the home enviroment is an important determinant of behavior in the developing individual.

With the publication of Pace's College and University Environment Scales by Educational Testing Service in 1963, interest in studying the instructional enviroment at the elementary, secondary, and higher educational levels has become a salient area of concern in recent investigations.

Available research indicates that studies dealing with school enviroment on an elementary and secondary level have been primarily observational and factual in nature (Coleman, 1966; Flizak, 1968; Sussman, 1968). Studies dealing with student perceptions were generally limited to only one aspect of the school enviroment; namely, the teacher-student relationship (Flanders, 1965; Gage, Leavitt & Stone, 1955). Few studies were concerned with systematically identifying multiple environmental features across several instructional settings (Sinclair, 1968).

The earliest systematic studies of teacher behavior were conducted by Anderson (1939). His work, based on the observation of dominative and integrative behaviors of teachers, stimulated other researchers to pursue this line of investigation, including Lippitt and White (1943), Whitall (1947) and Cogan (1956). Examples of the broadening nature of more recent studies of teaching behavior include the work of Ryans (1960), Barr (1961), Bellack and Davitz (1963), Flanders (1965), Amidon (1965) and Allen and Ryan (1969).

Recent efforts to increase the objectivity of research efforts relating to teaching behavior have been made by placing an emphasis on training outside observers in rating techniques. Murray (1938),

however, has argued that it is primarily the learner's perception of invironmental factors which largely determines his behavior. Rosenshine (1970), in an exhaustive survey of research in classroom evaluation techniques, concluded with the statement that in spite of increasing evidence that students can be used as reliable evaluators of instruction, relatively few studies to date have utilized the learner in a given environmental setting for the purposes of assessing instruction. It seemed reasonable to conclude that the nature of student perceived instructional behavior constitutes an important aspect of the total classroom environment needing further investigation.

Statement of the Problem

The purpose of this study was to develop an instrument for utilizing the perceptions of elementary school students' perceptions of their teacher's behavior in order to investigate the nature of possible relationships among various student-assessed teaching behaviors and other specific teacher, school and student demographic data. After reviewing a variety of rating scales, the Purdue Rating Scale for Instruction (PRSI) was selected as a basis from which to develop a suitable instrument for assessing pupil perceptions of instructional behavior. The original scale (PRSI), designed for use at the college level, was adapted for the purposes of this study. An estimate of the validity and reliability of the developed instrument was made during the pilot study and as the results of the analysis showed the instrument to be of acceptable value, student socioeconomic

and achievement data were used along with other variables in an interpretation and discussion of their possible effect on student rating patterns.

Significance of the Problem

Allowing students to serve as experts in rating their teachers is a relatively new idea in the field of education. Few parents and educators have, however, doubted that students have opinions about the quality of instruction they receive. Though numerous articles have been written arguing against the use of student ratings, Rosenshine (1970) found that measures of reliability conducted on the instruments he reviewed suggest that student ratings can provide a valuable source of information about the instructional behavior of teachers. McKeachie (1969) confirms this observation and makes a strong statement in favor of student evaluations by concluding in his report that the collective perceptions of students can, in fact, be considered a valid measure of teaching effectiveness. A review of related research literature conducted by the investigator, however, does not confirm McKeachie's strongly stated conclusion.

The present study is significant because a serious attempt has been made to develop a valid and reliable instrument for use by elementary students primarily for an analysis of student ratings of teaching behavior. Little confidence can be placed in the existing instruments for rating instruction because of the absence of clearly stated objectives and due to the procedures used in collecting and analyzing data.

It must be stated that the ultimate interest of this investigation was in studying the nature of student ratings, with particular concern for differences recorded among the students included in the sample. Because an assumption has been made that instructional behaviors affect students in varying ways, it would seem that to ignore variance in student perceptions of instructional behavior would result in limiting understanding of the possible relationships among teaching behaviors and individual learning needs. The significance of this statement is that an awareness of the student perceived conditions and processes existing in the classrooms would contribute to an understanding of the possible influence of instructional behavior actions on the development of terminal behavior in individual students.

Because so little has been known about the major ways in which students perceive classroom teaching behaviors, it was difficult to hypothesize how particular variables might affect the development of specific characteristics in students. It was necessary, therefore, first to develop a suitable instrument for describing the diversity of student perceptions of teaching behaviors in order to theorize their effect on the learner. The present study sought to identify some of the salient similarities and differences existing among selected elementary student's assessments of their teacher. The nature of the variations in ratings may constitute an important factor in the total school environment influencing the individual learner.

Definition of Terms

Environment. As used here, environment refers to the conditions, forces, and external stimuli which exert an influence on the individual. The environment is conceived to be a complex system of situational determinants fostering the development of individual characteristics. As suggested earlier, these determinants may be factors of social, physical, and intellectual significance. In an analysis of the role of the environment in behavior, Anastasi (1958) defined such determinants as direct influences resulting in behavioral change. Bayley (1957), Bloom (1964), Pace (1965), Stern (1963) and others have also viewed environment as a determinant of behavior. This conceptualization is based on the assumption that behavior is a function of the transactional relationship between the individual and his environment. Schutz's (1960) theory of interpersonal behavior needs lends further support to this view. By viewing the environment in terms of those aspects which are significant for the determination of behavior, it should be possible to isolate and classify important portions of the environment in which the individual lives.

An important conceptualization of the characteristics of the environment is offered by Murray (1938) who refers to those interpreted by observers of the environment as the "Alpha press" and those interpreted by individuals in the environment as "Beta press." Murray suggests that if an individual believes that a portion of the environment signifies a certain thing, it will be this perception that has an effect on his behavior. In other words, the individual's perceptions of the environment serve as one of the major determinants of behavior.

Teaching Behavior. Classroom instructional behavior may be studied at a variety of levels, depending on the purpose to be served by the inquiry. A basic level of inquiry, not within the scope of this study, deals with observing, describing, and classifying behavior. While this level of research is acknowledged to be of importance, this study is concerned rather with the identification of correlates to teaching behaviors previously selected. An important step in the realization of this objective was the development of a reasonably valid and reliable instrument for assessing various student perceptions of instructional behavior.

The manual for the Purdue Rating Scale for instruction defines the behaviors to be rated as " . . . traits associated with effective teaching." Examples of the traits selected by Remmers include: Fairness in Grading, Interest in Subject and Clarity of Presentations. These behaviors were adapted from an extensive list compiled by the University of Chicago "Better-Yet" Faculty-Student Committee and were published in the A A U P Bulletin (1926). The following clarification is necessary to establish a definition of teaching behavior consistent with the purposes of this study.

Webster's New World Dictionary of the American Language (1957) defines a trait as a distinguishable quality or characteristic. In order for a quality to be distinguishable, it must be perceptible and subject to isolation from other qualities. Because perception involves apprehension by the physical senses, it seems reasonable to assume that the subject, in this case the teacher, performs acts or behaviors which

affect the student's sensory apprehension. Therefore, teaching behavior is operationally defined for the purposes of this study to be: any act, conscious or unconscious, performed by the teacher within a classroom setting. The acts embraced by this definition of teaching behavior are not limited only to those with deliberate instructional intent but include a broad range of classroom behaviors. The above conceptualization of instructional behavior supports the notion that learning is the result of an interaction with the environment.

Approach of the Study

In approaching the problem, analysis suggested that following the determination of instrument validity and reliability, there would be the possibility of identifying teaching patterns which would distinguish between classrooms and school settings; namely, rural, town, suburban, city, and inner-city.

After identifying the characteristic profile of individual teachers, students who manifested a typical rating patterns were classified for further analysis to discover factors of significance between the classified groups and other selected variables. The data were treated to discover the significance of measured differences in perceived teacher behavior in relation to selected student variables in order to suggest areas for further investigation. Although this study acknowledges that elementary classroom teaching behavior varies from teacher to teacher, it remains neutral with regard to determining which behaviors are desirable or undesirable and for whom. The intention was

to develop a means for securing information regarding selected aspects of the teacher's behavior as part of the total school environmental press.

It is necessary to point out that to explore in full the diversity of behavioral factors would require a much larger study than the one conducted. The present investigation serves as a pilot study for a more comprehensive investigation of the range of instructional behaviors affecting the learner.

Collective ratings by fifth and sixth grade students of the selected instructional variables were used as a source for describing the teacher's behavior as representative of part of the school environment. In order to secure these perceptions, students were presented with questions about their teacher and his behaviors. The statements, derived from the original traits selected by Remmers, required a scaled frequency response ranging from positive to negative assessments of the behaviors. Based on the results of the pilot study and verified by an analysis of the main study data, an assumption was made that the perceptions of students living in a classroom environment are a source of valid and reliable descriptions of the teaching behaviors present in that environment.

Limitations of the Study

Generalizations of the findings in the present study are of necessity qualified by the following:

1. The study did not attempt to secure supervisory assessment or other information related to the instructional behavior of the sample teachers.

2. The schools selected for the sample were all public supported and no attempt was made to include non-public schools in the sample.

3. The sample of twenty classrooms was drawn primarily from the western Massachusetts area.

In commenting on empirically derived scales, Pace (1965) indicated that the stability of such scales depends on several statistical conditions. Among these are the number of institutions included in the initial study, the representativeness of the institutions and the reliability of the mean scores by which each teacher is described. The present study is limited by each of these conditions and, therefore, the Elementary Classroom Teacher Rating Scale must be accepted with certain reservations.

The following chapters describe the fulfillment of the study outlined on the preceding pages. Chapter II considers the theoretical foundations of the study. Chapter III describes the selection of the classrooms, development of the instrument, the pilot study, the validity and reliability of the instrument and the procedures followed for collecting, reporting and analyzing the data. The remaining chapters report the conclusions of the findings and implications for further research on elementary classroom teaching behavior and its affect on the learner.

CHAPTER II

THEORETICAL FOUNDATIONS OF THE STUDY

This chapter describes the theoretical background of the study and points to various references which provide sound support for it.

Theoretical Referents

The theoretical base for this study is drawn from two primary sources; Schutz (1960) and Murray (1938). A broad support for the role the environment plays in determining human behavior comes from Schutz's three-dimensional theory of interpersonal behavior. In his text, Schutz discusses the close parallel which exists between biological needs and interpersonal needs. He states that a biological need is a requirement to establish and maintain a satisfactory relationship between the individual and his physical environment, while an interpersonal need is a requirement to establish a satisfactory relationship between the individual and his human environment. Schutz further suggests that just as biological needs are not necessarily satisfied by providing unlimited gratification, the same is also true for interpersonal needs. One example of an interpersonal need delineated by Schutz is the need for control. This specific need may present problems to an individual by remaining unfulfilled as a result of his having too much control over his human environment, thus creating too much responsibility; or because of his having too little control, thus creating a sense of insecurity. According to Schutz, the individual must establish a

satisfactory relation with his interpersonal environment with respect to this variable as well as with the other variables he outlines.

Schutz's variables are: 1) the human need for inclusion, which deals with interaction and association (identity, togetherness, understanding); 2) the interpersonal need for control, which deals with control and power (decision-making, influence, leadership, self-control); and 3) the interpersonal need for affection which deals with love and affection (friendships, positive feelings, sharing). Several variables in the Elementary Classroom Teacher Rating Scale (ECTRS) developed for this study purport to measure student perceptions about these particular needs; namely the Helpfulness, Listening, Friendliness, Fairness and Humor variables.

Another important theoretical referent for this study comes from the work of Murray (1938). In his text, Murray makes the following comments about the importance of the environment and its subsequent effect on behavior. He says:

> Since at every moment, an organism is within an environment which largely determines its behavior, . . . the conduct of an individual cannot be formulated without a characterization of each confronting situation, physical and social (p. 39).

Murray further states:

> It is important to define the environment since two organisms may behave differently only because they are, by chance, encountering different conditions. What an organism knows or believes is, in some measure, a product of formally encountered situations. Thus, much of what is now <u>inside</u> the organism was once <u>outside</u> (pp. 39-40).

Analysis of this proposition suggests that personal motivations are closely related with events taking place outside of the individual. The motivational state of the individual and operant environmental

forces are intertwined, and both serve as determinants of an individual's behavior. In connection with this, Murray places emphasis upon the importance of environmental elements contributing to behavior. He stresses that the environmental context of behavior must be thoroughly understood and analyzed before an adequate account of individual behavior is possible.

Because of this close relationship between environment and behavior, Murray emphasizes the importance of adequately defining the environment. Subsequently, he has proposed two methods of approaching the problem, both contained in his concept of "press." Press is defined as an aspect of the total environment which helps or hinders the goal-oriented behavior of an individual. Press, therefore, may be roughly classified as either positive or negative. Positive press is usually enjoyable and beneficial, while negative press is usually distasteful and harmful. By representing the environment in terms of press, it is possible to extract and classify the significant portions of the environment in which the individual lives.

The two categores of press previously alluded to are labeled Alpha press and Beta press. Alpha press, according to Murray, is that which actually exists and would, therefore, be measurable only by trained observers. An example of Alpha press would be the notated objective observations of classroom interactions (e.g. Flander's Interaction Analysis, 1960) by a trained outside observer. Contrastingly, Beta press refers to a participating individual's own reported perception of the environment and his subsequent interpretation of it. The ECTRS is

an example of such a subjective measure of the Beta press. Alpha press, then, is represented by the comment of a non-participating trained observer of the environment and Beta press is the comment of a direct participant in the environment. This study deals only with the Beta press; the teacher's instructional behavior as perceived and reported by the students participating in the classroom environment.

Numerous studies have subsequently attempted to measure the environmental "press" of different educational institutions. Pace and Stern (1958), Thistlethwaite (1960), Holland (1959, 1960, 1965, 1966) and Astin (1965) investigated the "press" of various colleges and universities. Moreover, the "press" of different secondary school curricula has been studied in an attempt to relate subjective teacher evaluations to student variables (Barclay, 1967). Patterns of variables of successful and unsuccessful students differed in different academic areas, indicating the presence of a culturally-transmitted, curricular-related "press" or bias. Sinclair (1968), in an unpublished doctoral dissertation, measured selected variables of environmental press in elementary schools.

In quoting Murray (1938), it was stated earlier that individuals often behave differently because they are responding to different environments. Bloom (1964) makes a similar case for the importance of environmental factors accounting for individual differences. In Stability and Change in Human Characteristics, he says: "in opinion of this writer, much of what has been termed individual variation may be explained in terms of environmental variation (p. 199)." Bloom further

states that great effort has been exerted to measure individual differences and that much research has been devoted to explaining the sources of this variation but little has dealt with parts of the environment as contributing factors. Bloom describes current environmental indices as being relatively gross and general (e.g., social class status, socio-economic levels, occupation and educational levels of parents) and calls for more adequate and precise measures before understanding of growth and development can be accomplished.

In describing human characteristics, Bloom indicates that some characteristics reach a terminal maturity (as in the case of height) and fail to change after that. These are nonreversible characteristics. Other human characteristics may continue to develop throughout an individual's lifetime. Bloom's task was to identify degrees of stability and change of different characteristics at various stages of human development. Once these have been established, then the theoretical limits of prediction and control can be seriously investigated; namely, the factors and conditions affecting this characteristic at crucial periods in the course of development can be examined and structured so as possibly to alter and/or direct developmental patterns. The age at which many characteristics reach their full development no doubt varies from the very early years to post adolescence.

The powerful effect of environment, specifically the home environment, on the educational achievement of children has been established in many studies dealing with identical twins, fraternal twins, siblings. and unrelated children reared both together and apart (Newman, Freeman, and Holzinger, 1937).

Similarly, Wolf (1963) conducted research dealing with the various aspects of achievement, motivation, language development and general learning as selected variables of environmental press in the home and found a correlation of +.76 between measures of these home-based presses and scores on the Henmon-Nelson I. Q. scales. Therefore, while there exists genetic potential for learning, the direction this learning takes, as measured by the case of school achievement measure, appears to be powerfully determined by the environment and its presses. It should be noted here, however, that recent findings reported by Jenson (1969) raise new questions in this area, and the potency of genetic determinants of intelligence is currently being reassessed.

Bloom (1964) states that environments have a number of highly specific characteristics and, as a result, have highly specific consequences for human growth and development. He states:

> We do suggest that the strategy of research on environmental variation begins with the attempt to describe and measure the specific characteristics of environments and then proceeds to the study of the consequence of various combinations of these specific characteristics (p. 186).

In Bloom's text, many references are made to human characteristics as they are affected by the home environment and the total environment, but no extended reference is made to the school environment.

This study attempted, through the use of student assessments, to measure characteristics of elementary classroom teaching behavior and deal with the relationships found between those assessments and combinations of demographic variables.

C H A P T E R I I I

RESEARCH PROCEDURES

This chapter describes the research procedures used in the study. It also describes the selection of the sample, development of the instrument, the pilot study, administration, selection of raters for study of atypical patterns and the methods of analysis.

Selection of the Sample

Schools and Classrooms. Twenty classrooms from thirteen elementary schools in the state of Massachusetts were selected for the investigation. Typically, two classrooms were selected in each of the schools with the exception of four rural schools, where only one classroom each was used in the main sample. The sample included eight fifth-grade classes, eleven sixth-grade classes and one combination fifth and sixth-grade class. The intention was not to identify schools representative of any particular region but rather to select classrooms representing diverse population clusters, settings and demographic conditions so that the larger elementary school population might be characterized. The immediate results of the study will be limited to the elementary classrooms included in the sample. No claim is made for generalizability except as pertains to evidence for further study.

The following definition of population clusters adapted from the U. S. Department of Commerce 1960 Census Report and the report of the Title I, Education of the Disadvantaged Program (1965) was used in

identifying the primary clusters from which the sample was selected:

Rural -- an unincorporated area not near a large or middle size city.

Small city or town -- an incorporated area with a population range less than 50,000.

Large city -- an incorporated area with a population range of 200,000 and over.

The Title I report defines two large city populations; one with a range of 200,000 to 500,000 and the other 500,000 and over. Considering the patterns of population density characteristic of the New England region, the two definitions were combined for the purposes of the study.

Elementary schools were selected from the basic population clusters defined above. Four were selected to represent each of the following settings: rural, town, suburban, city, and inner-city. These settings offered variations in the number of students, the ethnic characteristics of the student populations, and variations in family occupational and economic categories. Samples were drawn from both middle and large size cities having inner-city areas. A description of the characteristics of the school sample is included in Table 1.

Teachers and Students. Fifth and sixth-grade children who attended the class of a selected teacher for at least one semester comprised the main sample. Those learners, then, who judged what was or was not characteristic instructional behavior for their teacher were the ones who had gained a broad base of experience on which to form their judgements. The total universe of learners was administered the rating instrument and those not meeting the residency requirement were not considered in the analysis of data.

Table 1

Diverse Features of Sampled Schools
by Setting and in Descending Order of Sample Class Size

SETTING	CLASS CODE	SCHOOL SIZE	GRADES	AGE OF PLANT	RACIAL COMPOSITION	SIZE OF SAMPLE CLASS	GRADE OF SAMPLE
Rural	RA1	95	4-6	55	99% Caucasian (0% Spanish Surname) 0% Negroid, 1% Oriental	32	5
Rural	RC1	157	1-6	4	100% Caucasian (0% Spanish Surname) 0% Negroid, 0% Other	28	6
Rural	RD1	345	3-6	18	100% Caucasian (1% Spanish Surname) 0% Negroid, 0% Other	27	5
Rural	RB1	93	K-6	20	98% Caucasian (0% Spanish Surname) 0% Negroid, 0% Other	26	5-6
Town	TA1	686	K-6	1	95% Caucasian (1% Spanish Surname) 2% Negroid, 2% Other	36	5
Town	TA2	686	K-6	1	95% Caucasian (1% Spanish Surname) 2% Negroid, 2% Other	36	5
Town	TB1	150	5-6	2	97% Caucasian (1% Spanish Surname) 2% Negroid, 1% Other	24	6
Town	TB2	150	5-6	2	97% Caucasian (1% Spanish Surname) 2% Negroid, 1% Other	20	6
Suburban	SB1	395	K-6	75	98% Caucasian (3% Spanish Surname) 0% Negroid, 2% Oriental	37	6
Suburban	SA2	395	K-6	75	98% Caucasian (3% Spanish Surname) 0% Negroid, 2% Oriental	33	5
Suburban	SA1	371	K-6	67	100% Caucasian (1% Spanish Surname) 0% Negroid, 0% Other	31	5

Table 1 (Continued)

SETTING	CLASS CODE	SCHOOL SIZE	GRADES	AGE OF PLANT	RACIAL COMPOSITION	SIZE OF SAMPLE CLASS	GRADE OF SAMPLE
Suburban	SC1	398	K-6	19	100% Caucasian (1% Spanish Surname) 0% Negroid, 0% Other	25	6
City	CB2	370	K-6	45	98% Caucasian (0% Spanish Surname) 0% Negroid, 2% Oriental	32	6
City	CB1	370	K-6	45	98% Caucasian (0% Spanish Surname) 0% Negroid, 2% Oriental	31	6
City	CA2	523	K-6	39	80% Caucasian (4% Spanish Surname) 19% Negroid, 1% Oriental	30	6
City	CA1	523	K-6	39	80% Caucasian (4% Spanish Surname) 19% Negroid, 1% Oriental	28	5
Inner-City	IA1	870	K-6	45	25% Caucasian (1% Spanish Surname) 75% Negroid, 0% Other	29	6
Inner-City	IB3	210	5-6	75	86% Caucasian (11% Spanish Surname) 10% Negroid, 4% Other	25	6
Inner-City	IB2	210	5-6	75	86% Caucasian (11% Spanish Surname) 10% Negroid, 4% Other	25	6
Inner-City	IB1	210	5-6	75	86% Caucasian (11% Spanish Surname) 10% Negroid, 4% Other	23	5

A listing of the size of each school, the number of children reporting in each classroom and the number of reports eliminated from each classroom is presented in Table 2.

Development of the Rating Instrument

The Elementary Classroom Teacher Rating Scale is a five point vertical frequency response scale consisting of ten behaviors adapted from the Purdue Rating Scale for Instruction. The ten teaching behaviors to be rated are: 1) Likes to Teach; 2) Helpfulness; 3) Friendliness; 4) Fairness; 5) Listens to Ideas; 6) Explaining Things; 7) Sense of Humor; 8) Habits; 9) Looks; and 10) Fun in Learning. Each behavioral category is represented by a single question requiring a perceived frequency response ranging from "All of the time" to "None of the time."

The Elementary Classroom Teacher Rating Scale (ECTRS) represents a major adaptation of Remmers' Purdue Rating Scale for Instruction (PRSI). Although the original scale is intended to measure college and university teaching behavior rather than elementary classroom teaching behavior, the purpose of the instrument, as stated in the technical manual, is in agreement with the general concern of this study. The statement (p. 7-8) is as follows:

> The Purdue Rating Scale for Instruction purports to measure the student's judgements of the instructor . . . . Those who use this scale are cautioned to bear in mind constantly that it is primarily a devise for ascertaining the student judgements concerning the traits in question. On the other hand, regardless of what the teacher believes or knows about himself . . . with respect to those traits, the student attitude exists, and exists as an important functioning factor in the teaching situation.

Table 2

Distribution of Reports of Teaching Behavior in Descending Order of Number in Research Sample

CLASS CODE	SCHOOL SIZE	SAMPLE CLASS NUMBER	STUDENTS REPORTING	REPORTS ELIMINATED	RESEARCH SAMPLE
SA2	395	33	31	1	30
CB2	370	32	30	0	30
CB1	370	31	30	0	30
TA1	686	36	30	2	28
TA2	686	36	29	1	28
CA2	523	30	29	1	28
RC1	157	28	28	0	28
RA1	95	32	28	0	28
SB1	395	37	30	3	27
SA1	371	31	27	0	27
IA1	870	29	26	1	25
CA1	523	28	25	2	23
RD1	345	27	25	0	25
SC1	328	25	24	1	23
IB3	210	25	23	0	23
IB1	210	23	22	0	22
RB1	93	26	21	0	21
TB2	150	20	19	0	19
IB2	210	25	21	3	18
TB1	150	24	18	1	17
TOTAL	7,139	578	516	14	500

Description of the Purdue Rating Scale for Instruction. The portion of the PRSI modified for this study consists of ten behaviors judged by Remmers to be essential for effective classroom teaching. In developing this part of his instrument, Remmers selected behaviors from an extensive list published in a University of Chicago faculty-student committee report. Later, the instrument was expanded to include sixteen additional variables dealing with such other educational concerns as class size, peer ability and appropriateness of teaching methods.

The ten instructional behaviors identified by Remmers which formed the basic point of departure for developing the ECTRS were: 1) Interest in Subject; 2) Sympathetic Attitude Toward Students; 3) Fairness in Grading; 4) Liberal and Progressive Attitude; 5) Presentation of Subject Matter; 6) Sense of Proportion and Humor; 7) Self-reliance and Confidence; 8) Personal Peculiarities 9) Personal Appearance and 10) Stimulating Intellectual Curiosity. For each behavior, three varying descriptive cues, spaced evenly over a ten-point horizontal scale, are presented providing a response range for a positive to a negative assessments of each instructional variable. All ten behaviors and their cues are presented on a one-page form for machine scoring.

Remmers' instrument has been used principally for developing collective student-assessed profiles of teaching behaviors for instructor self-evaluation purposes. In addition to this, however, the scale developed in this study was used for collecting data to study the nature of student rating patterns. In order to use the instrument for rating teaching behavior by elementary school children, it was necessary to

make adjustments and alterations so that it would be educationally sound for fifth and sixth-grade children.

Modifying the Instrument. The PRSI was examined by the investigator for effecting various modifications deemed appropriate to the needs of the study. Words and phrases which seemed to be unsuitable for the intended population were translated into terms believed to be more appropriate. An attempt was made to preserve the original meaning whenever possible.

Although horizontal scale arrangements are the most common means of presentation, several investigators, including Champney (1941), have recommended the use of vertical forms, particularly when positive and negative responses are suggested. Remmers (1967) suggests developing scales to measure only one aspect per page as a means of controling rating contamination through halo effect and other possible response sets. After considering the above arguments, a decision was made to reduce the scale presentation from ten points to a five-point vertical from presenting one behavior on each page. Rater instructions were appropriately revised.

Refining the Instrument. To further develop the modified instrument, evaluative steps were taken prior to pilot testing. The steps included:

1. Expert Evaluation

   Given the purpose of the study, the instrument was reviewed by five higher education and early-childhood authorities and by two elementary school principals for the purpose of recommending revisions. Using the PRSI for reference, the reviewers were asked to record comments and suggestions concerning the appropriateness of the adaptation including their assessment of the vocabulary used and the clarity of instructions.

The eight reviewers all recommended simplifying the vocabulary, both in the instructional portions and in the rating scale itself. It was further suggested that the text be submitted to analysis utilizing an appropriate readability formula to assess the approximate grade level of the vocabulary. Three reviewers recommended equalizing the scaled response cues for all ten behaviors to eliminate assessment difficulties and to further optimize the possibility of valid responses by elementary school children.

Though content validity was not a major concern in this study because of the focus of the problem (namely, to study atypical rating patterns), one of the most significant questions raised was whether or not children could assess "self-reliance" and "confidence." Remmers included both traits in his instrument. All reviewers indicated that the original category labeled "Sympathetic Attitude Toward Students" was too complex for elementary children to assess and recommended that it be expressed as two separate behaviors - "Helpfulness" and "Friendliness." In discussing content validity, Shaw and Wright (1967) state: "In practice, the evaluation of content validity is usually a subjective, judgmental procedure. Almost always, the scale constructor chooses items that seem to have 'content validity'."

With the exception of specific suggestions related to vocabulary, all experts concurred in their positive overall judgment of the validity of the instrument. Based on the comments and recommendations, revisions were made in the vocabulary and rating categories, including the division of "Attitude" into two parts resulting in an eleven-item rating scale.

The next step in instrument refinement involved classroom teachers.

2. Professional Teaching Staff Evaluation

> The revised instrument was then submitted to five upper-grade teachers. Given the purpose of the study, the staff members were asked to record comments and suggestions related to vocabulary, clarity of instructions and anticipated teacher and student response.

The five evaluating professional teaching staff personnel, representing traditional and innovative biases, recorded affirmative evaluations of the vocabulary and directions for rating. Four of the five examiners recommended modifying the response scale to five equalized cues. They also questioned the ability of students to distinguish between objectionable classroom habits and other personal habits such as smoking. All reviewing teachers strongly recommended, from previous experiences, that the instructions and behaviors to be rated should be read out loud to circumvent unpredictable reading and interpretation problems. Students were then asked to review the instrument.

3. Student Evaluation

> Based on teacher recommendations identifying students representative of a variety of reading, achievement, and ethnic backgrounds, the investigator individually interviewed eight fifth and sixth-grade children to assess the face validity of the instrument and to consider other problems of interpretation and administration. An interview schedule was utilized as a means for controlling questions and for recording responses and suggested modifications.

Davis (1964) states that face validity refers to the extent to which an instrument appears, on casual inspection, to measure what it is intended to measure and emphasizes the importance of carefully designed procedures for assessment. The procedures relating to the interview were as follows:

1. A brief explanation of the purpose of the interview was made to each student.

2. The students were asked to read the instructions in the sample rating booklet out loud. They were then asked to explain, in their own words, their understanding of the purpose and overall rating procedures to be followed. In all cases, it was determined that the students understood the purpose and the instructions.

3. The students were then asked to examine and read out loud each teaching behavior cited and its response cues. The investigator noted apparent reading problems. Students were then asked to interpret the behavioral variables. If the resulting explanation indicated that the variable was not understood, the investigator explained what was meant by the behavior under question using other examples. Following the explanation, students were then asked to reword the variable in terms they could better understand. The investigator noted the suggestions on the interview form.

A second revision of the instrument based on the teacher and student interview responses was made. The principle changes included: 1) equalizing the frequency response cues, 2) deleting the task of evaluating the self-confidence of a teacher (resulting in a ten-item scale) and 3) drafting questions related to the behavior under question. It should be noted that, with one exception, all of the response scales ranged from a positive assessment ("All of the time") to a negative assessment ("None of the time") with the positive cue presented at the top of the page. The one negatively stated question dealing with objectionable habits required reversal of the positive response direction. This appeared to present no problems to the raters.

Although Remmers (1963) suggests that the socially desirable end of a scale should be the same for all traits rated, it has also been argued that the desirable end should alternate randomly from one item to the next to control response sets, particularily those of halo and

leniency. Guilford (1954) states, however, that the fact of such control has never been demonstrated. In experimentation with the ten selected traits of college teaching, Remmers (1960) verified this point by finding no systematic difference between one arrangement and the other. Students rated their teachers equally well by either technique.

In order to ascertain the approximate level of reading difficulty presented by the pilot version of the ECTRS, the Lorge Formula (1959) was employed. Utilizing the Dale List of 796 Easy Words and counts of prepositional phrases and the number of sentences and words, it was determined through calculation that the reading level was at grade 3.5 - well within the intended ability of most fifth and sixth-grade children. The decision to read the entire booklet out loud was a further guarantee of minimal interpretation problems.

The Pilot Study

The pilot version of the ECTRS was administered to five upper-elementary grade classrooms with similar descriptors to those planned for the main sample. The classrooms were not visited again for data collection purposes. The major objectives of the pilot study were: 1) to identify administration and data collection problems and 2) to assess the validity and reliability of the instrument. Close attention was also given to time factors, problems of data analysis and to student, teacher and administrator reactions.

In connection with the selection of sample schools and classrooms, superintendents selected from rural, town, suburban and city

settings were contacted and personally interviewed by the investigator to explain the purpose of the study and the planned procedures for collecting data.

Based on superintendents' recommendations, principals were contacted to explain the study and to suggest teachers whom they felt might be willing to cooperate in the study. Permission was also requested for securing pertinent teacher and student demographic data. On the basis of the interviews, it was determined that I.Q. and student achievement records were not generally available and that the teacher would need to be relied upon for more subjective data in these areas than was originally intended.

Following interviews with recommended instructors agreeing to participate in the study, which tended to identify stronger and more successful teachers, a time was scheduled during the mid-morning hours for instrument administration. School and teacher data forms were completed at this time. Pupil demographic data forms were explained and left with the teacher for completion prior to the scheduled administration visit. The teachers were also requested to prepare a roster of the children to be used at the time of instrument administration for correlation of data.

It was determined from the pilot study that teachers and administrators were favorably impressed with the comprehensive qualities of the instrument and with the data collection procedures. They were particularily interested in the collective profiles which were planned as part of the first phase in data analysis.

Validity Measures

In his text, Statistics in Education, Tate (1955) states that the primary aim of statistical procedures is to obtain trustworthy evidence. He goes on to define validity as the first condition of trustworthy evidence. The development of an instrument such as the ECTRS presents serious problems related to estimating validity due to the lack of adequate outside criterion measures for possible correlation. Remmers (1960) attempted to circumvent the problem when analyzing the results of his rating scale by asserting that validity can be satisfactorily established by examining the extent to which students agree among themselves and the extent to which each student is self-consistent in his judgments. Remmers did not concern himself with the usual kinds of validity mentioned in the literature but subsumed the various concerns under one title, Validity.

An investigation of the general literature related to validity estimates not considered by Remmers reveals that Davis (1964) offers a possible solution to the problem of outside criterion measures. He states that when criterion scores or reasonable approximations cannot be obtained, validity must be estimated by judgmental means rather than empirical means and suggests three possible categories. The first is Constructor Validity, assessed by comparing instrument content with purpose. The second category is User Validity, estimated by comparing content with administrator purpose. The third is Face Validity, assessed by comparing content with rater interpretation.

The nature of this investigation suggested a need to utilize judgmental procedures similar to those outlined by Davis for assessing validity. However, due to the fact that, in this study, the constructor and the user are synonomous, consideration suggested a combination of Davis's categories. The resulting new category was termed "Design Validity" by this investigator.

Design Validity. Given a clear statement of the purpose for which the instrument was to be used, the circumstances under which the rating scale was to be administered, the procedures to be followed, a description of the sample population and a descriptive outline of the behaviors to be assessed, three education experts judgmentally assessed the validity of the instrument by recording acceptance or rejection of the following:

1. Clarity of rater instructions.
2. Liklihood of the administration procedures producing valid results.
3. Validity of each of the instructional behaviors to be rated when related to the purpose of the instrument.

With the exception of one examiner who questioned the impersonal wording of the questions (i.e. "How often does your teacher do something that really bothers the class?") and of another who questioned the student's ability to rate "Fairness" of the teacher, all behavioral categories and instructions were judged valid by the experts. The educators included authorities in the fields of early childhood education, educational administration and educational research. See Appendix A for the instrument used for assessing Design Validity.

In addition to the above reactions, the evaluators suggested some possible word revisions and minor design alterations for consideration. One expert recommended the use of a prepared statement to be read by the classroom teacher when introducing the instrument administrator in order to eliminate possible variance in set. This recommendation was subsequently adopted as part of the general instrument administration control procedures. See Appendix A for all forms related to validity assessment and scale administration.

Face Validity. The other form of validity to be discussed is face validity. In reality, face validity refers not to what the test actually does measure but what it superficially appears to measure (Anastasi, 1961) and is a desirable feature of any scale or test. If the scale appears inappropriate or irrelevant, poor cooperation may be the result regardless of the scale's actual value. Face validity is therefore important both for the subjects who respond to it and for the professional educators who decide upon its use. The ECTRS was judged to have adequate face validity. Teachers, principals and students generally demonstrated a very positive reaction to the design of the scale and indicated its timeliness and relevance to their concerns for improving instruction.

Following instrument administration in each of the pilot classes, twenty percent of the raters were randomly selected from the class list and individually interviewed to assess formally the face validity of the instrument. Interviews were conducted by the investigator in the classroom immediately following scale adminis-

tration. An interview schedule form developed earlier was utilized for each student (see Appendix A). General procedures relative to the interview were conducted as follows:

1. A brief explanation was made to the student explaining the purpose of the interview.

2. Based on instructions presented during the rating period, the student was asked to explain, in his own words, the purpose of the scale and the procedures to be followed for rating the behaviors. Acceptance or rejection of the replies was judgmentally made and recorded on the interview form.

3. The student was then read each of the ten instructional behavior categories and the related behavior assessment question and asked to explain what each meant. When the explanation indicated to the investigator that the student understood the trait, the items was accepted as being valid. If the interpretation was judged false, the investigator noted rejection of the item and questioned the validity of the wording.

Of the ten traits, the one dealing with bothersome habits presented rating problems to thirty-two percent of the interview sample, suggesting that some further revision needed to be made. Also, interpeting the degree of a teacher's sense of humor presented difficulty for twenty percent of the interviews. It was noted that most problems of interpretation came from the inner-city sample. The remaining eight traits and their behaviorally stated questions were judged acceptable, with only four percent of the sample revealing difficulty with judging the appropriatness of a teacher's dress and the same percent with the degree to which the teacher made learning enjoyable.

Overall, the pilot instrument was judged to have an acceptable degree of validity. An urban education expert was consulted for the

purpose of suggesting possible rewording of the two problem behaviors in an attempt to increase overall student comprehension of the rating task. It should be recalled that in the judgment of one elementary education expert, the validity of the behavior relating to a teacher's fairness was questioned. Fairness, however, did not seem to present a rating problem to the students interviewed in the pilot sample.

After further consultation with several education experts, a decision was made to retain the impersonal nature of the expressed behaviors as an additional means for screening atypical raters within a given classroom and to present the instrument in a less threatening form to classroom teachers.

Reliability Measures

The application of reliability statistics to data with sociometric implications involves certain acknowledged difficulties. According to Remmers (1963), several authors have pointed out that the concepts of test-retest reliability and internal consistency can be relatively meaningless when applied to studies of this kind. Lindzey and Borgatta (1954) suggest that test-retest coefficients may be unreliable due to real change in the viewpoint of the rater; thus, a low reliability coefficient would actually indicate a test of high sensitivity whereas a high reliability coefficient would suggest an insensitive test which had failed to measure interpersonal relationships.

For these reasons, it was decided to utilize procedures similar to those used by Remmers in assessing the reliability of the

PRSI. Though reliability is basically a function of wide score dispersion of variance, the Elementary Classroom Teacher Rating Scale actually seeks a high degree of consensus among respondents making variance minimal except in the case of the more deviant responses which were sought for realizing the ultimate concern of this investigation. It was found, when analyzing the data from the different classes, the collective ratings did establish differentiating behavioral patterns among the teachers and that there was sufficient variance to provide adequate data for assessing the reliability of the instrument.

Remmers' analysis of the PRSI yielded reliability estimates ranging from +.84 on the Fairness scale to +.92 on the Personal Appearance scale when applying the Spearman-Brown modified split half formula to the sample. Similar analysis of the ECTRS produced estimates ranging from .00 on the Likes to Teach scale (pilot study) to +.83 on the Fun in Learning scale (Main sample). It should be noted that the low reliability coefficient resulted from the high degree of agreement between the two randomly split halves. The main study sample produced a coefficient of +.70 on the same scale.

Application of the Horst formula to the total sample resulted in reliability coefficients in excess of those recorded in Remmers' analysis. The ECTRS coefficients ranged from +.94 on the Fairness scale (pilot sample) to +.97 in the main sample. Remmers' scale produced coefficients of +.87 on the Sense of Proportion and Humor scale to +.94 on the Personal Appearance scale when utilizing the same formula.

The reliability estimates for both the pilot and main study administrations utilizing the Spearman-Brown modified split-half method and the Horst Formula may be found in Table 3. Because both methods utilize scores from a single administration of the scale, the reliabilities may be slightly over-estimated (Tate, 1955). However, it will be noted when examining Table 3 that the reliability coefficient reported for the pilot sample using the Spearman-Brown formula on "Listen to Ideas" was +.90 whereas the same teaching behavior analysis resulted in a coefficient of only +.35 for the main sample. One possible explanation can be offered by considering the random sampling resulting from the split-half technique.

When comparing the Horst formula reliability estimates computed by Remmers with the estimates of the present study, it should be noted that the ECTRS exhibits reliability coefficients that are generally comparable to or in excess of the Purdue Rating Scale for Instruction. Thus, overall, it can be said that the ECTRS compares favorably with the PRSI.

Finally, the overall reliability of the scale compares quite favorably with the reliabilities of the better psychological instruments available. If one can accept Remmers' argument concerning the use of high reliability coefficients to justify validity, the ECTRS can also be judged to have adequate validity based on similar statistical analysis. The final version of the ECTRS is located in Appendix B.

Table 3

Reliability Coefficients for Each Instructional Variable

Variable	PILOT SAMPLE		MAIN SAMPLE	
	Spearman-Brown 7 vs 7	Horst Formula N=113	Spearman-Brown 9 vs 9	Horst Formula N=500
1. Likes to Teach	0.00**	0.96	0.70	0.96
2. Helpfulness	0.82*	0.96	0.62	0.96
3. Friendliness	0.96	0.96	0.70	0.96
4. Fairness	0.47	0.94	0.67	0.97
5. Liscens to Ideas	0.90*	0.95	0.35	0.96
6. Explaining Things	0.90*	0.95	0.74	0.96
7. Sense of Humor	0.98	0.96	0.81	0.96
8. Habits	0.75	0.96	0.64	0.96
9. Looks	0.70	0.97	0.59	0.96
10. Fun in Learning	0.87*	0.96	0.83	0.96

Underlined coefficients are significant at .01 level

*Significant at .05 level

**Due to the lack of deviation between the means of the randomly split halves used in the analysis of the two groups

The Main Study

The procedures described below were followed in both the pilot study and the main study and were found to be satisfactory in both instances.

Administration of the Instrument. The entire population of each classroom was administered the rating scale. Provisions were made for screening out student rating data from 1) those who had not been under the instruction of the sample teacher for at least one full semester, 2) those who were reading below grade level to such a degree that they could not read and comprehend the instructions or the teacher behaviors to be rated and 3) students who did not speak or read English. Such conditional information was indicated on the numbered roster prepared by the teacher in advance (See Appendix C). Table 2, cited earlier, indicates the number of reports eliminated for these primary reasons. The administration took place during the mid-morning hours in every case. The following administration procedures were observed:

1. Using a prepared outline, the teacher introduced the investigator, explained the task, and assured the students of his voluntary participation in the study. He then absented himself from the classroom for the remainder of the rating period.

2. After greeting the students in such a way as to reduce a student anxiety and promote honest responses on the scale, the investigator distributed the rating booklets by calling the name of each child from the coded class list.

3. Being assured that all students were equipped with pencils and erasers, they were asked to open their booklets to the

first page and follow the text as the administrator read the instructions.

4. Continuing to read the procedures in the booklet, the students filled in the sample rating scale. The investigator then ascertained that the students understood the process for marking by randomly checking the responses made.

5. After providing an opportunity to ask questions, the raters were then asked to turn to the first behavior and read it with the investigator before rating it. Each behavioral heading and question was subsequently read out loud by the investigator. Following the completion of the task, the students were requested to go over each rating given and reconsider their decision. They were encouraged to make changes at this time if they wished.

6. As there was no set time allotment for completing the scale, booklets were collected individually as individual students indicated that they were finished. Discussion among the students prior to the end of the completed rating period was not permitted.

Data Collection and Analysis. The data were collected over a period of five weeks (See Appendix C for all forms related to Demographic Data Collection) and transfered to keypunch cards for computer analysis. Class, population cluster grouping, and total sample means were calculated for forming profiles of each teacher and for determining the class rating pattern on each teaching behavior for each individual teacher. The data from each class contributed to producing two superimposed graphic representations for comparison and analysis; 1) teacher profiles and 2) total sample profiles.

Having determined the range and frequency of responses on each variable, it was then necessary for the purposes of this study to delineate atypical rating patterns for further analysis to see what combination of demographic variables might identify the extreme raters.

1. Students were ranked by class from high to low on the basis of their total rating of the teacher.

2. The upper and lower 27% of the class was initially identified as a preliminary sample. Since total ratings were frequently identical, this procedure was not completely satisfactory. It was considered important to include all raters with the same totals and group them together as a single unit, thereby somewhat expanding the original 27% of the cases.

3. Having completed the preceding screening step, the mean and standard deviations were calculated for all behaviors by class. Students who deviated more than one standard deviation above the mean and those who deviated more than one standard deviation below the mean were selected from the preliminary expanded samples and sorted into high and low rating groups.

4. In order to further identify extremes and to compensate for the positive cultural bias, those raters who rated their teacher positively in three or more variables or negatively in two or more were selected from their respective groupings to form the final research samples.

These steps resulted in identifying two extreme (atypical) rater groups comprised of 25 high raters and 28 low raters and a third group of 447 raters identified as the "typical" group. These identified groupings were used in the final analysis of data. Analysis of the reported student, teacher and school variables collected was conducted by means of a multiple discriminate stepwise analysis program which: 1) computed the discriminate function of individual and combination variables, 2) produced F matrices of group classification values, 3) produced discriminate functions for each variable by group and 4) produced classification matrices of case assignments.

Discriminate analysis is employed when groups of persons are identified a priori and the purpose is to distinguish the groups

from one another on the basis of score profiles. Stepwise discriminate analysis maximizes the discrimination among groups by combining variables and combinations of variables making it possible to predict group membership for new cases.

The resulting profiles, comprehensive data and analysis may be found in Chapter IV.

CHAPTER IV

FINDINGS AND DISCUSSION

This chapter presents an analysis and interpretation of data collected utilizing the Elementary Classroom Teacher Rating Scale (ECTRS). Other data referents were selected for discussion after analyzing the results of a multiple stepwise discriminate analysis of the predictive power of various demographic descriptors collected on each student in the sample.

In order to identify and classify typical and atypical rater groupings for statistical analysis, it was necessary first to determine what the characteristic classroom behavior was for each teacher in the sample.

It is important to state at the outset of this presentation that though the findings of such exploratory and initial investigations as this one are tenuous and must be treated as such, the results of the statistical analysis indicated that there is sufficient evidence for the generation of hypotheses for further study.

Teaching Behavior Findings

The instructional behavior of each teacher, representing one aspect of the total classroom learning environment, was measured via the ten behavior variables rated with the ECTRS:

Behavior I -- Likes to Teach

Behavior II -- Helpfulness

Behavior III -- Friendliness

Behavior IV -- Fairness

Behavior V -- Listens to Ideas

Behavior VI -- Explaining Things

Behavior VII -- Sense of Humor

Behavior VIII -- Habits

Behavior IX -- Looks

Behavior X -- Fun in Learning

Analysis revealed that the teachers included in the sample classrooms exhibited a variety of differences in instructional behavior. Because of the large number of classes included in the sample (20) and the relatively small number of students reporting on each teacher (17-30), it was important to examine differences among the teachers before categorizing the raters for further study (see Chapter III). To illustrate this point, what might be an extreme rating for a particular instructional behavior in one class might be typical in another, depending on the overall class response to the behavior of the two teachers. The differences in instructional behavior reported are expressed in two principle ways: in forms of class response variance on the individual teaching behaviors and in forms of total class and sample responses on all instructional variables.

Class Response Variance on Individual Teaching Behaviors

Response variance among the behaviors rated is presented for each teacher in several ways: Tables 4 through 23 indicate the mean,

standard deviation, scores and range for each teaching behavior; Tables I through X in Appendix D present the frequency and percent of distribution of the teaching behaviors among the various classes; Tables 24 through 33 present the distribution across all classes by instructional variables; Figures 1 through 20 present a combination of individual teacher and sample mean profiles with supporting mean Tables XI through XXX which may be found in Appendix D.

Means, Standard Deviations, and Score Ranges. In examining Tables 4 through 23, it will be noted that for all but two teachers (see Tables 7 and 22), scores of five (All of the time) were given for all teaching behaviors rated. In these two exceptional cases, maximum scores of four (Most of the time) were indicated for Listens to Ideas (V), Fun in Learning (X) and Sense of Humor (VII). It is noteworthy that the standard deviations were, however, the same in both cases. Table 4 describes the only teacher in the sample who was not rated with a five on Listens to Ideas (V) by any students. Although other tables also indicate a range of three for Listens to Ideas (V), the mean score (3.13) for the teacher represented in Table 7 was the lowest of the sample with a standard deviation of .97.

Tables 22 and 23 reveal that an analysis of Looks (IX) resulted in both the highest (1.86) and the lowest (.21) standard deviations reported in the entire sample. The larger ranges shown in Tables 10 and 12 indicate the greatest variety of within-class student response variation to each behavior. Overall, there is more dispersion in the measurement of behaviors rated in Table 10; this is reflected in the

consistently high ranges and in the relatively high standard deviations reported

Frequency and Percent Distribution. Another way of investigating the characteristics of teaching behavior differences is to examine the frequency and percent of distribution across classes on each teaching variable as reported in Tables I through X in Appendix D. An overall view of how each variable was rated in different classes may be seen by reading across the frequency distributions listed for each behavior. For example, the number of students rating each teacher within a given rating category related to Likes to Teach can be found in Table I. Variance among classes is found by reading across the page--9, 3, 5, and so on. The percent of class computations presented in the lower half of the same tables are a better illustration, perhaps, of the same data.

In examining Table II (Helpfulness), it is noteworthy that seventy percent of one class (coded IB3) rated the teacher with a five (All of the time), whereas the ratings of another class (coded IB2) on the same variable were more evenly spread over the five response categories with twenty-two percent of the class rating the teacher with either a two (Some of the time) or a three (All of the time). When comparing Tables V and VI, it can be seen that the frequency and percent of class IB2 indicated that the teacher was rated the same on both Listens to Ideas and Explaining Things. An examination of the ratings in each class revealed, however, that individual students varied in their perceptions of the behaviors; only the total class remained the same.

Table 4

Class RA1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.93	1.02	5	2	3
II	3.89	0.88	5	1	4
III	4.32	0.67	5	3	2
IV	4.07	0.90	5	1	4
V	4.18	0.86	5	2	3
VI	4.25	0.89	5	2	3
VII	4.71	0.53	5	3	2
VIII	3.89	1.17	5	1	4
IX	4.46	1.00	5	1	4
X	4.04	0.74	5	2	3

N=28

Table 5

Class RB1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.57	0.98	5	2	3
II	3.95	0.97	5	2	3
III	3.38	1.02	5	1	4
IV	3.86	0.96	5	2	3
V	3.76	1.04	5	2	3
VI	3.33	1.28	5	1	4
VII	2.67	1.15	5	2	4
VIII	3.52	1.29	5	1	4
IX	4.24	1.45	5	1	4
X	2.76	1.34	5	1	4

N=21

Table 6

Class RC1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.11	0.50	5	3	2
II	4.07	1.02	5	1	4
III	4.11	0.63	5	3	2
IV	3.57	1.00	5	2	3
V	4.18	0.67	5	3	2
VI	4.00	0.94	5	2	3
VII	3.75	1.08	5	2	3
VIII	4.00	0.77	5	2	3
IX	4.32	1.31	5	1	4
X	3.57	0.96	5	2	3

N=28

Table 7

Class RD1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.96	1.02	5	1	4
II	3.35	1.15	5	2	3
III	3.43	0.95	5	1	4
IV	3.09	1.00	5	1	4
V	3.13	0.97	4	1	3
VI	4.22	0.85	5	2	3
VII	2.83	1.11	5	1	4
VIII	3.52	0.85	5	1	4
IX	4.09	1.28	5	1	4
X	2.57	0.99	4	1	3

N=23

Table 8

Class TA1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.21	0.50	5	3	2
II	4.25	0.75	5	2	3
III	4.54	0.51	5	4	1
IV	4.57	0.50	5	4	1
V	4.29	0.53	5	3	2
VI	4.36	0.62	5	3	2
VII	4.11	0.83	5	2	3
VIII	4.50	0.64	5	3	2
IX	4.39	0.79	5	2	3
X	3.61	0.79	5	2	3

N=28

Table 9

Class TA2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.64	0.78	5	2	3
II	3.79	0.88	5	2	3
III	3.64	0.87	5	2	3
IV	3.82	1.12	5	1	4
V	4.07	0.98	5	2	3
VI	3.86	0.97	5	1	4
VII	3.00	1.27	5	1	4
VIII	3.67	1.02	5	1	4
IX	3.39	1.31	5	1	4
X	2.79	1.26	5	1	4

N=28

Table 10

Class TB1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.12	1.05	5	1	4
II	4.00	1.00	5	1	4
III	3.82	1.42	5	1	4
IV	3.76	1.20	5	1	4
V	4.00	1.32	5	1	4
VI	4.23	1.15	5	1	4
VII	3.76	1.44	5	1	4
VIII	3.82	1.42	5	1	4
IX	3.94	1.39	5	1	4
X	3.29	1.36	5	1	4

N=17

Table 11

Class TB2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.05	0.62	5	3	2
II	4.63	0.60	5	3	2
III	4.37	0.50	5	4	1
IV	4.11	0.94	5	2	3
V	4.32	1.00	5	2	3
VI	4.37	0.76	5	3	2
VII	3.95	0.85	5	2	3
VIII	4.47	0.51	5	4	1
IX	3.82	1.17	5	2	3
X	3.89	0.88	5	2	3

N=19

Table 12

Class SA1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.48	0.85	5	1	4
II	3.93	1.21	5	2	3
III	3.74	1.02	5	1	4
IV	3.89	1.25	5	1	4
V	3.30	1.35	5	1	4
VI	4.33	0.88	5	2	3
VII	3.93	1.07	5	2	3
VIII	3.59	1.28	5	1	4
IX	3.96	1.58	5	1	4
X	2.70	1.30	5	1	4

N=27

Table 13

Class SA2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVICR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.17	0.83	5	2	3
II	4.33	0.96	5	2	3
III	4.17	0.65	5	2	3
IV	4.27	0.65	5	2	3
V	3.97	0.96	5	2	3
VI	4.67	0.48	5	4	1
VII	4.10	0.92	5	2	3
VIII	4.57	0.57	5	3	2
IX	4.80	0.48	5	3	2
X	3.90	0.88	5	2	3

N=30

Table 14

Class SB1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.33	0.62	5	3	2
II	4.07	0.91	5	2	3
III	4.56	0.51	5	4	1
IV	4.63	0.63	5	3	2
V	4.11	1.09	5	1	4
VI	4.44	0.58	5	3	2
VII	4.26	0.81	5	2	3
VIII	4.63	0.63	5	3	2
IX	4.78	0.51	5	3	2
X	3.96	0.85	5	2	3

N=27

Table 15

Class SC1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.35	0.49	5	4	1
II	4.48	0.79	5	2	3
III	4.39	0.66	5	3	2
IV	4.74	0.62	5	3	2
V	3.87	0.81	5	3	2
VI	4.78	0.42	5	4	1
VII	4.35	0.65	5	3	2
VIII	4.65	0.49	5	4	1
IX	4.74	0.86	5	2	3
X	4.52	0.79	5	2	3

N=23

Table 16

Class CA1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.52	0.59	5	3	2
II	3.80	1.04	5	1	4
III	4.28	0.79	5	2	3
IV	3.84	1.03	5	2	3
V	3.64	0.95	5	2	3
VI	4.16	0.80	5	2	3
VII	3.24	1.13	5	1	4
VIII	3.88	1.17	5	1	4
IX	4.48	0.59	5	3	2
X	3.64	1.04	5	2	3

N=25

Table 17

Class CA2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.61	1.10	5	1	4
II	4.32	0.94	5	2	3
III	4.07	0.86	5	2	3
IV	3.86	1.27	5	1	4
V	3.82	1.06	5	2	3
VI	4.50	0.79	5	2	3
VII	3.71	1.01	5	1	4
VIII	4.14	0.89	5	1	4
IX	4.54	1.17	5	1	4
X	3.75	1.24	5	1	4

N=28

Table 18

Class CB1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.20	0.55	5	3	2
II	4.43	0.73	5	2	3
III	4.27	0.64	5	2	3
IV	4.40	0.77	5	2	3
V	4.30	0.75	5	2	3
VI	4.27	0.87	5	1	4
VII	4.47	1.14	5	1	4
VIII	4.17	1.02	5	1	4
IX	4.50	1.25	5	1	4
X	4.10	0.92	5	2	3

N=30

Table 19

Class CB2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.07	0.74	5	2	3
II	4.50	0.63	5	3	2
III	4.17	0.70	5	3	2
IV	4.23	0.63	5	3	2
V	4.03	0.72	5	2	3
VI	4.47	0.62	5	3	2
VII	4.47	0.68	5	3	2
VIII	4.23	0.77	5	2	3
IX	4.00	1.14	5	1	4
X	3.37	1.00	5	2	3

N=30

Table 20

Class IA1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.08	1.00	5	2	3
II	3.80	1.19	5	2	3
III	3.88	0.97	5	2	3
IV	4.40	0.82	5	2	3
V	4.44	0.92	5	1	4
VI	4.80	0.41	5	4	1
VII	3.56	1.23	5	2	3
VIII	4.28	1.02	5	2	3
IX	4.80	0.82	5	1	4
X	3.72	1.06	5	1	4

N=25

Table 21

Class IB1: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.82	1.14	5	2	3
II	3.82	1.01	5	2	3
III	3.64	1.18	5	2	3
IV	4.36	0.90	5	2	3
V	3.82	1.14	5	2	3
VI	4.18	1.01	5	2	3
VII	3.14	1.08	5	1	4
VIII	3.41	1.40	5	1	4
IX	4.41	0.73	5	3	2
X	4.00	0.98	5	2	3

N=22

Table 22

Class IB2: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	3.06	1.21	5	1	4
II	2.89	1.03	5	1	4
III	3.33	1.03	5	2	3
IV	3.06	1.80	5	1	4
V	3.50	1.15	5	1	4
VI	3.28	1.36	5	1	4
VII	2.94	1.11	4	1	3
VIII	3.33	1.57	5	1	4
IX	3.06	1.86	5	1	4
X	2.44	1.10	5	1	4

N=18

Table 23

Class IB3: Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teacher Behavior

BEHAVIOR	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.39	0.72	5	2	3
II	4.65	0.57	5	3	2
III	4.09	0.73	5	2	3
IV	4.57	0.84	5	2	3
V	4.70	0.64	5	3	2
VI	4.57	0.73	5	3	2
VII	3.78	1.09	5	2	3
VIII	4.30	0.64	5	3	2
IX	4.96	0.21	5	4	1
X	4.04	0.82	5	2	3

N=23

Class SA1, presented in Table VI has a bimodal frequency distribution on Explaining Things with thirty-three percent of the class rating the teacher with either a two (Some of the time) or a four (Most of the time) and with the smallest number of students rating the class in the three (About half of the time) category. A similar pattern is exhibited by the same class in Table X for Fun in Learning. Table IX presents an interesting bimodal pattern for the teacher in class IB2 on Looks with thirty-nine percent of the class rating the teacher at either extreme.

Distributing of Class Responses by Percent Range. The characteristics of teaching behavior assessment variance can be further examined by studying Tables 24 through 33 which describe the distribution of total class response for each instructional variable. The number of classes that rated a teacher similarly within the various percent ranges is indicated. For example, Table 32 indicates that Looks was rated five (All of the time) by ninety to one hundred percent of the students in three classes, while in fourteen classes, one to nine percent of the students rated the teacher with a (None of the time). In general, it can be stated that more students rated their teachers with extremely favorable responses in this category (Looks) than on any other. After examining Tables 28 and 29, it may also be stated that more students rated Listens to Ideas and Explaining Things unfavorably than any other teaching variable.

Table 24

Distribution of Class Responses for Behavior I:
LIKES TO TEACH

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	1	5	4	5	4	1				
4		1			9	5	3	2		
3	10	6	2	2						
2	15	3	1	1						
1	20									

N=20

Table 25

Distribution of Class Responses for Behavior II:
HELPFULNESS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	1	1	5	5	1	4	2	1		
4			5	7	3	3	2			
3	10	7	3							
2	11	5	3	1						
1	19	1								

N=20

Table 26

Distribution of Class Responses for Behavior III:
FRIENDLINESS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	2	2	5	4	5	2				
4			1	3	8	3	5			
3	11	5	3	1						
2	13	4	3							
1	18	2								

N=20

Table 27

Distribution of Class Responses for Behavior IV:
FAIRNESS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	1	2	5	2	3	4		2	1	
4	1	1	3	6	5	4				
3	8	7	4		1					
2	12	5	3							
1	20									

N=20

Table 28

Distribution of Class Responses for Behavior V:
LISTENS TO IDEAS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	1	1	4	8	3	1	1	1		
4	1	2	3	6	4	2	1			
3	8	6	5	1						
2	9	9	2							
1	19			1						

N=20

Table 29

Distribution of Class Responses for Behavior VI:
EXPLAINING THINGS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5		1	2	3	6	3	2	2	1	
4	1	1	4	6	6	2				
3	13	4	2	1						
2	15	2	1	1						
1	18	1		1						

N=20

Table 30

Distribution of Class Responses for Behavior VII:
SENSE OF HUMOR

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	5	1	5	2	3	2		2		
4		2	2	7	6	2				
3	12	5	3							
2	7	4	5	4						
1	17	2	1							

N=20

Table 31

Distribution of Class Responses for Behavior VIII:
HABITS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	1		5	5	4	1	3	1		
4		1	2	8	4	5				
3	10	8	1	1						
2	15	3	2							
1	17	2	1							

N=20

Table 32

Distribution of Class Responses for Behavior IX:
LOOKS

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5			2	2	2	4	1	2	4	3
4		2	4	3	6	5				
3	4	8	7	1						
2	5	8	5	1	1					
1	14	5	1							

N=20

Table 33

Distribution of Class Responses for Behavior X:
FUN IN LEARNING

Number of Sample Classes in Percent Range

Rating	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100
5	4	5	5	4			2			
4		2	4	3	6	5				
3	4	8	7	1						
2	5	8	5	1	1					
1	14	5	1							

N=20

Teacher and Sample Profiles. Graphic representation of behavioral differences reported among the individual teachers may be found in Figures 1 through 20. The mean scores from which the profiles were drawn can be found in Appendix D, Tables XI through XXX. To illustrate variance in instruction, it will be noted when comparing the profiles of Figure 1 and Figure 2 the first teacher was rated considerably higher on Sense of Humor than his counterpart, with a mean difference of 2.04 which was determined by comparing means found on Tables XI and XII in Appendix D. Also, comparing with the total sample profile, the teacher represented in Figure 2 was rated below the mean on all behaviors but Looks. It will be noted that of the twenty sample classes, only two (Figures 4 and 19) were consistently below the sample mean on all behaviors. An interesting profile is presented in Figure 9. Although the teacher was rated below the sample mean in nine of the ten categories, he was rated above the mean on Explaining Things.

FIGURE 1

Teacher and Sample Profiles:

CLASS RA1

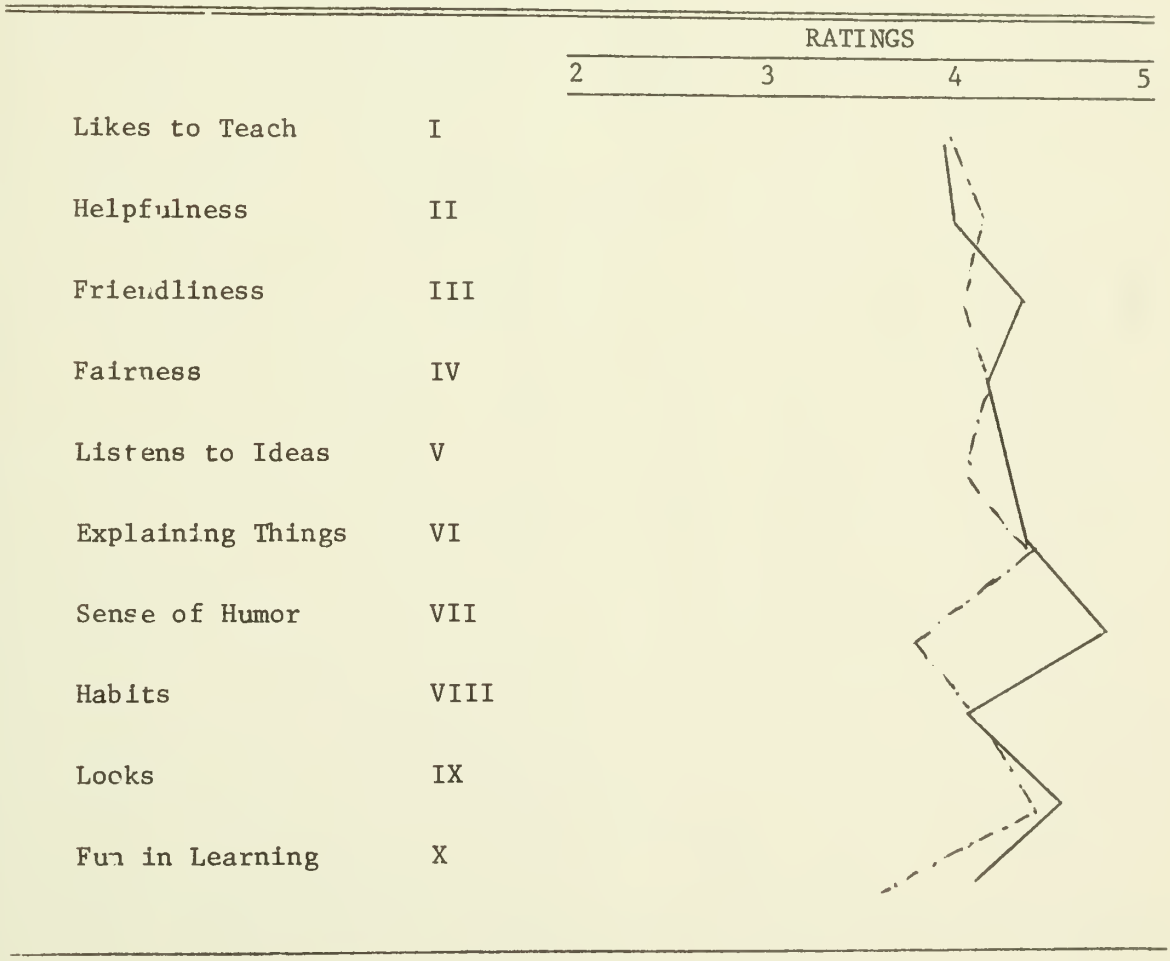
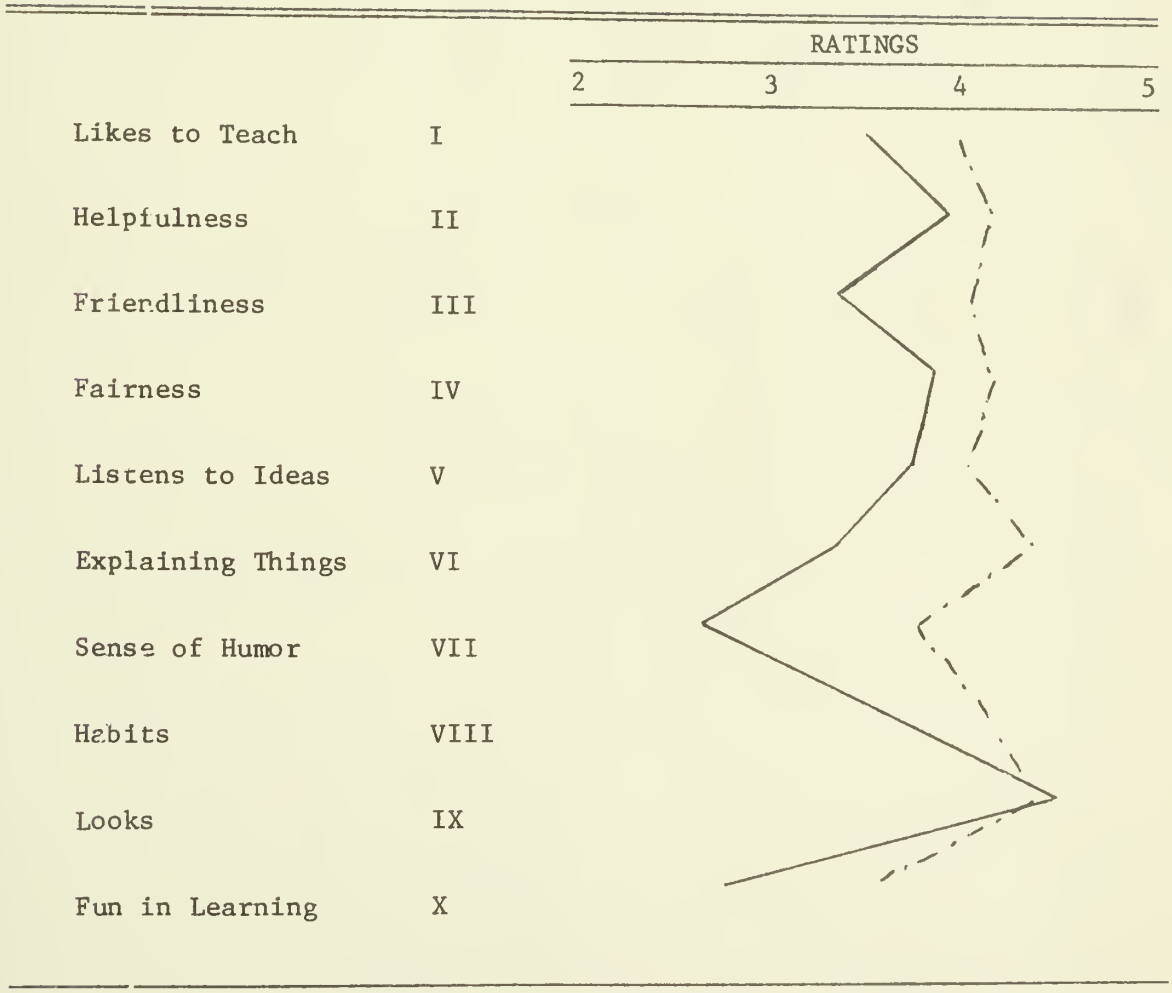


FIGURE 2

TEACHER AND SAMPLE PROFILES:

CLASS RB1



_____ Teacher

_._._._._. Sample

FIGURE 3

Teacher and Sample Profiles:
CLASS RC1

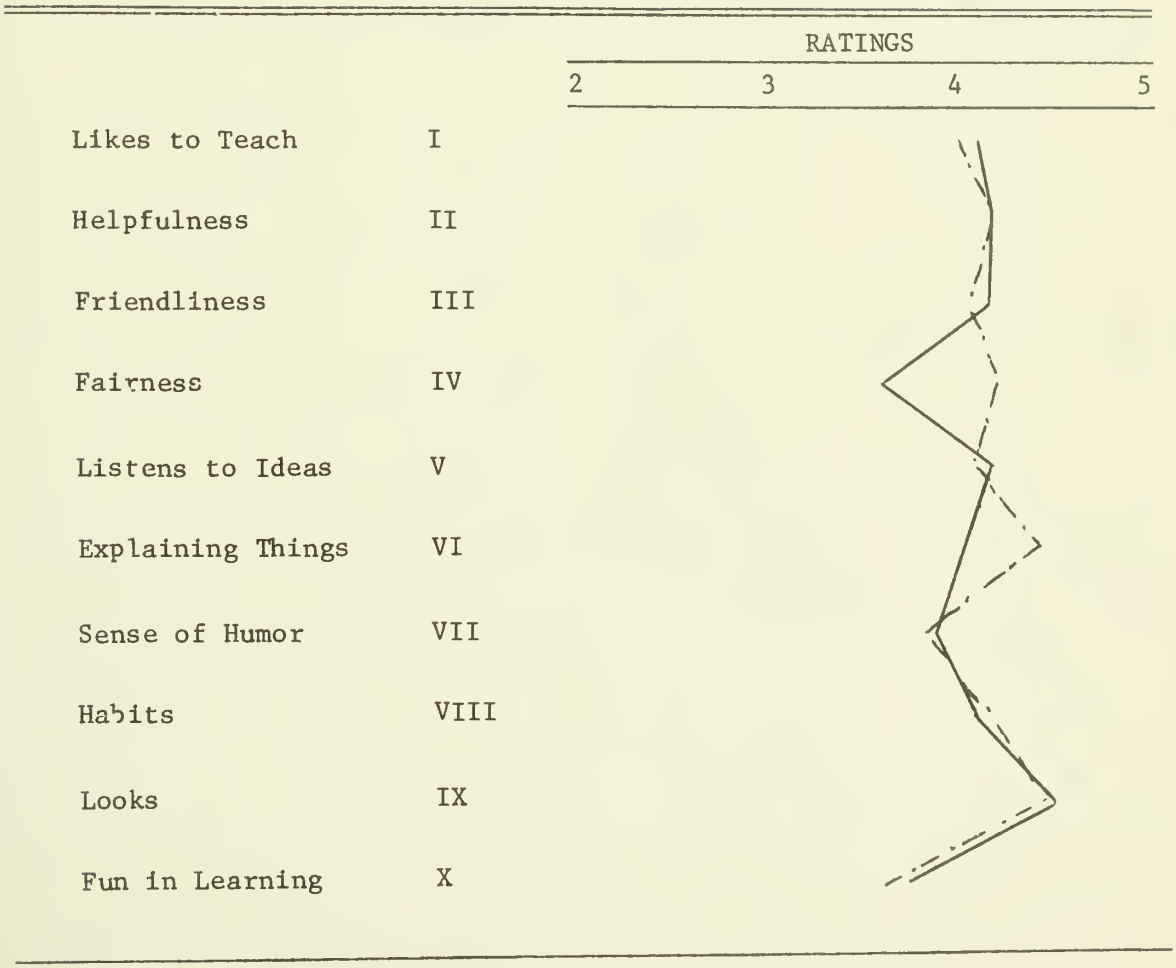
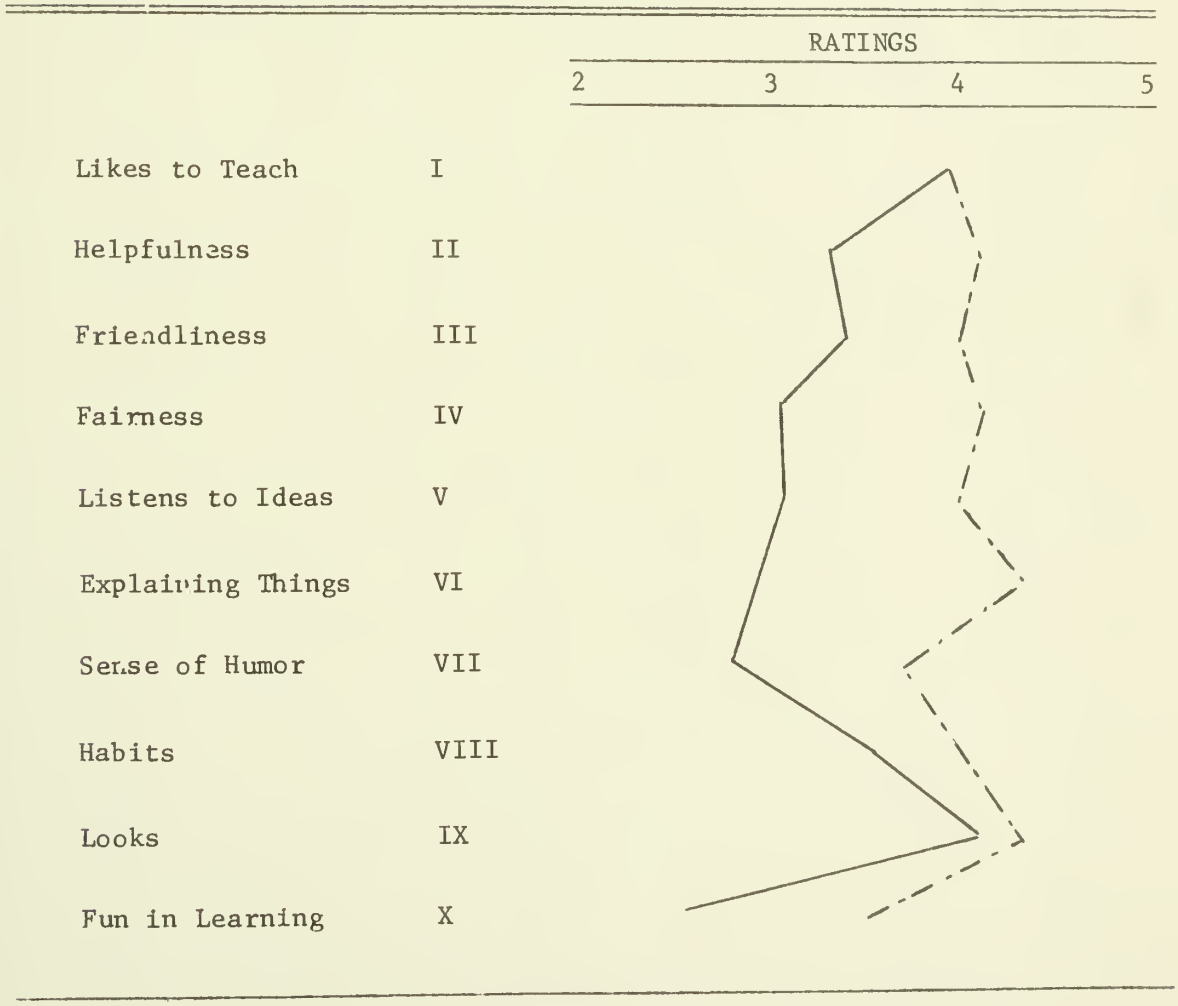


FIGURE 4

Teacher and Sample Profiles:

CLASS RD1



_____ Teacher

_._._._._. Sample

FIGURE 5

Teacher and Sample Profiles:
CLASS TA1

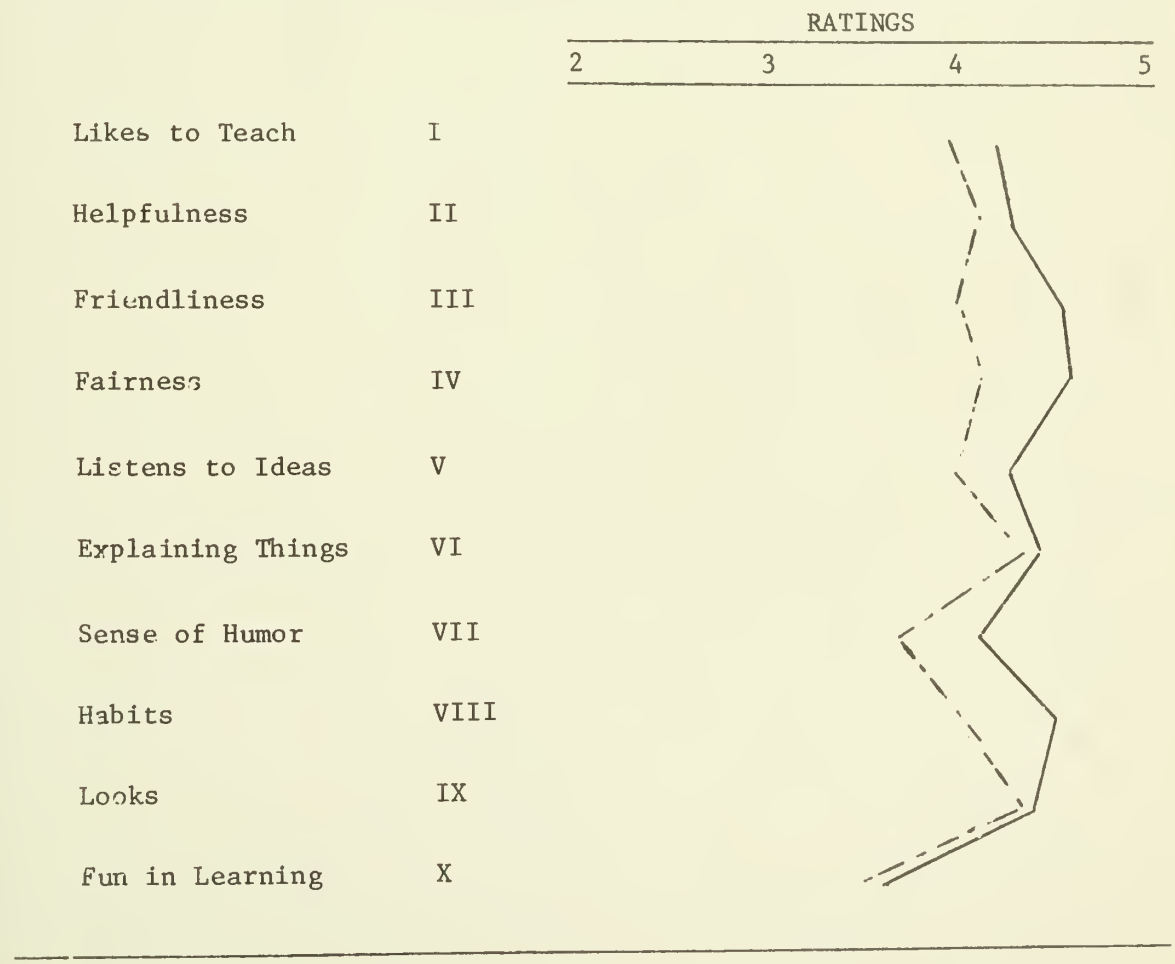


FIGURE 6

Teacher and Sample Profiles:

CLASS TA2

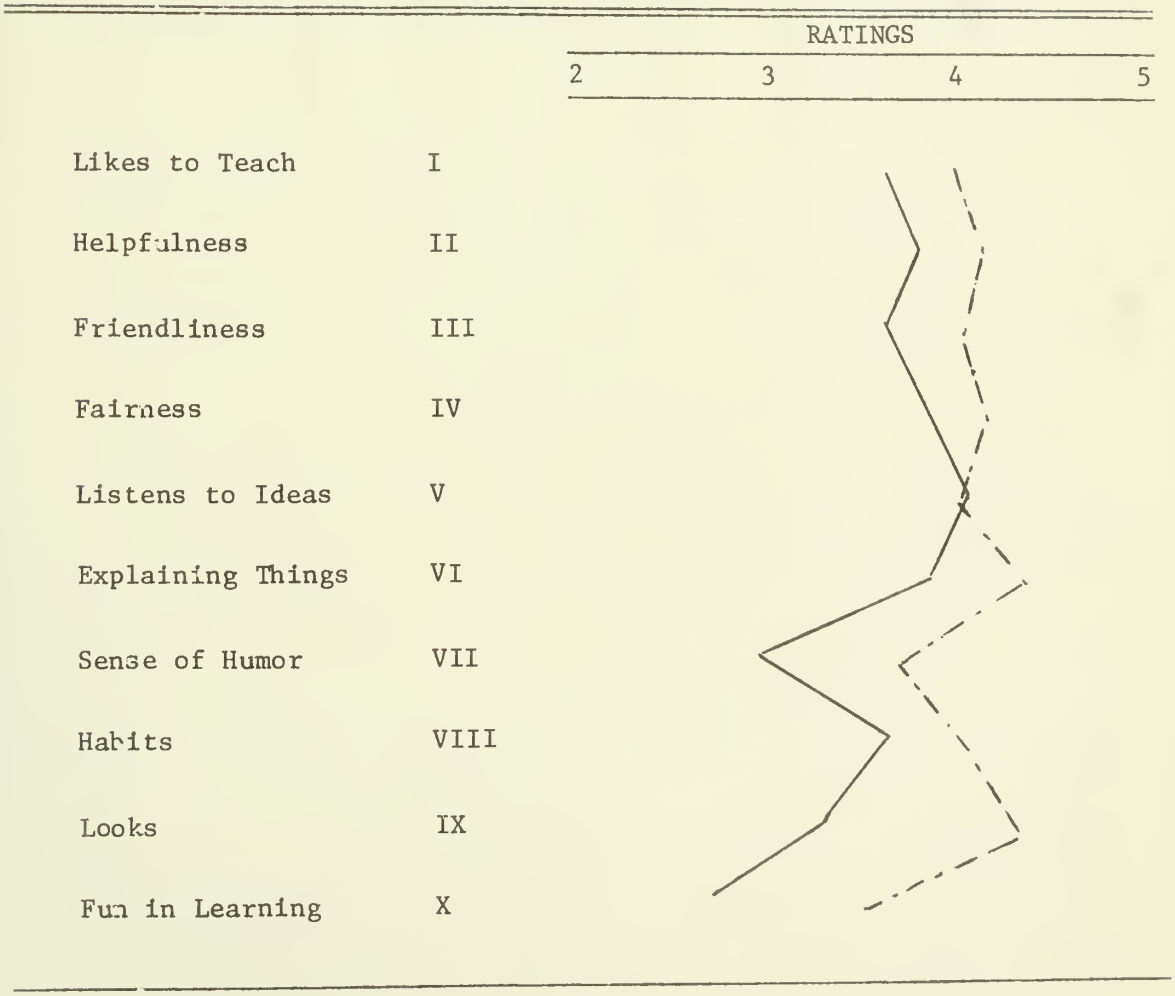
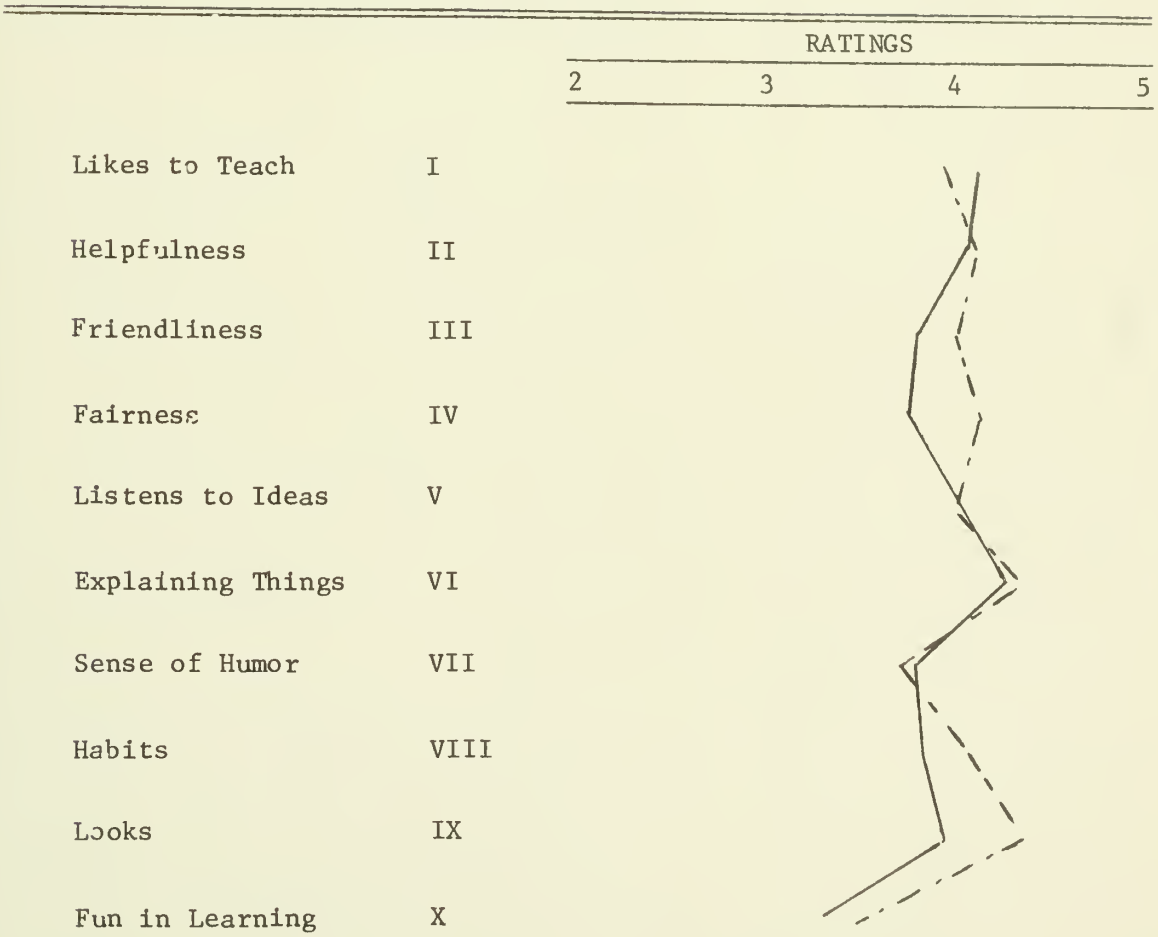


FIGURE 7

Teacher and Sample Profiles:

CLASS TB1



_____ Teacher

_._._._._ Sample

FIGURE 8

Teacher and Sample Profiles:

CLASS TB2

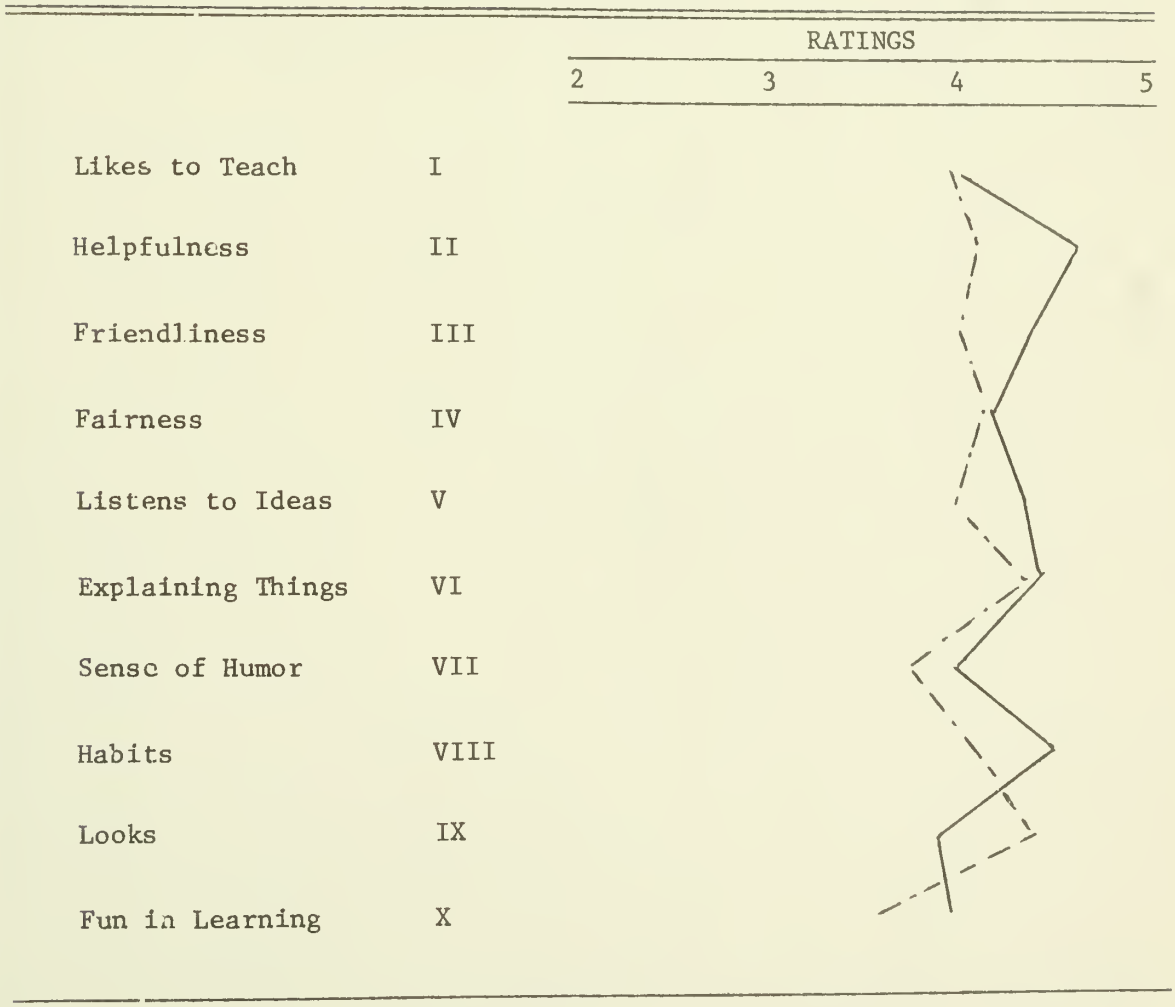
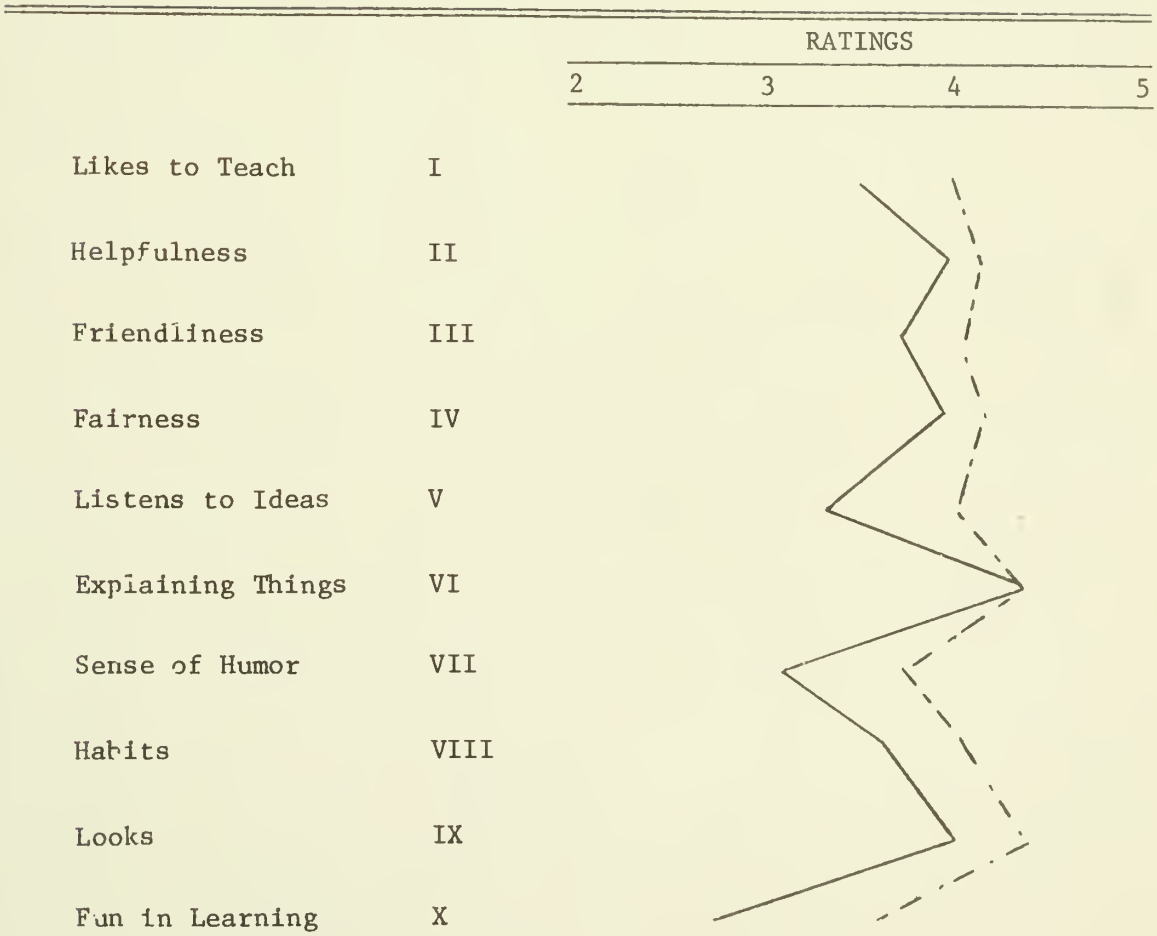


FIGURE 9

Teacher and Sample Profiles:

CLASS SA1



_____ Teacher

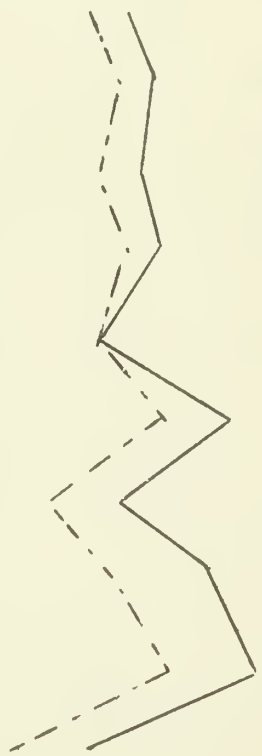
_._._._._. Sample

FIGURE 10

Teacher and Sample Profiles:

CLASS SA2

		RATINGS			
		2	3	4	5
Likes to Teach	I				
Helpfulness	II				
Friendliness	III				
Fairness	IV				
Listens to Ideas	V				
Explaining Things	VI				
Sense of Humor	VII				
Habits	VIII				
Looks	IX				
Fun in Learning	X				



_____ Teacher

_._._._._. Sample

FIGURE 11

Teacher and Sample Profiles:

CLASS SB1

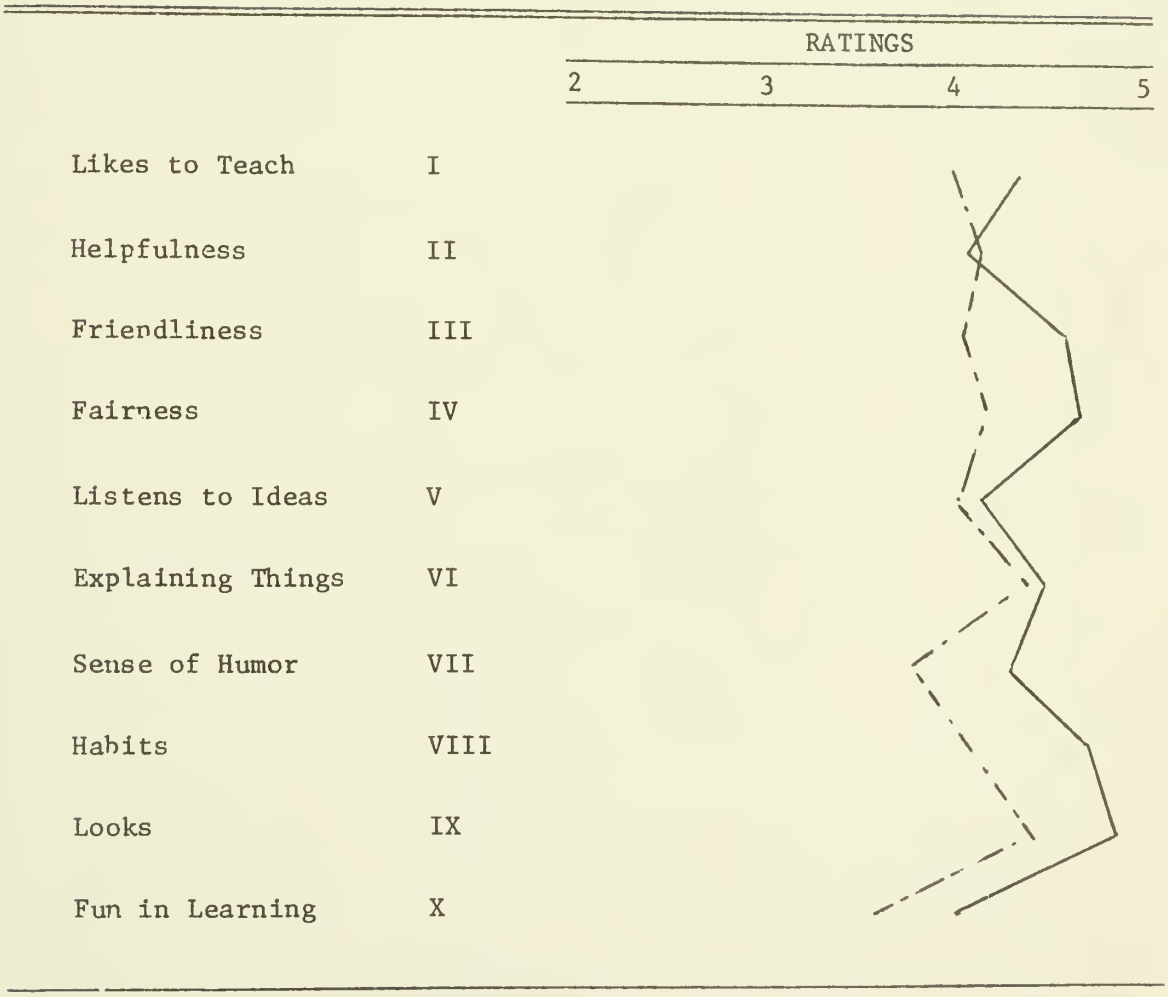
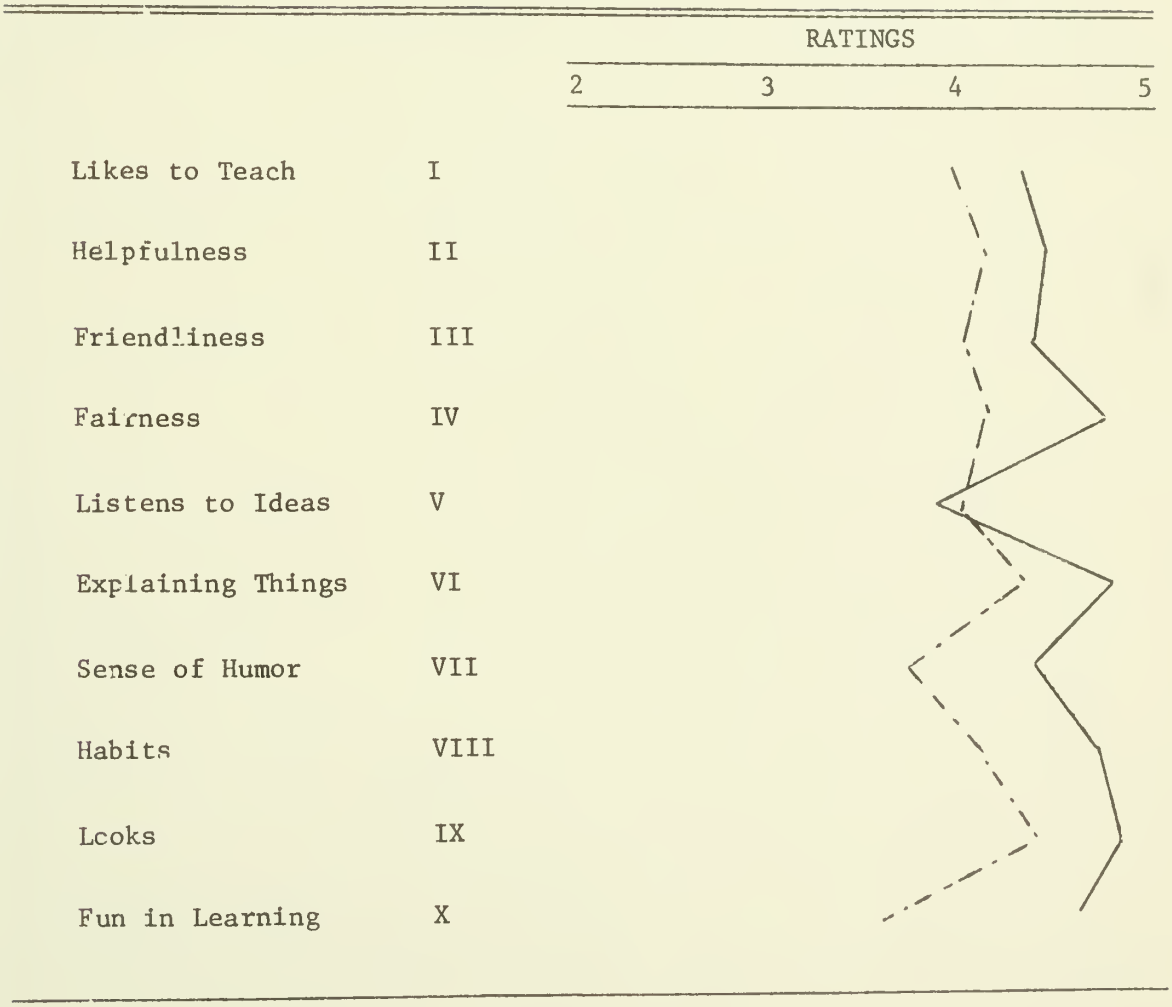


FIGURE 12

Teacher and Sample Profiles:

CLASS SC1



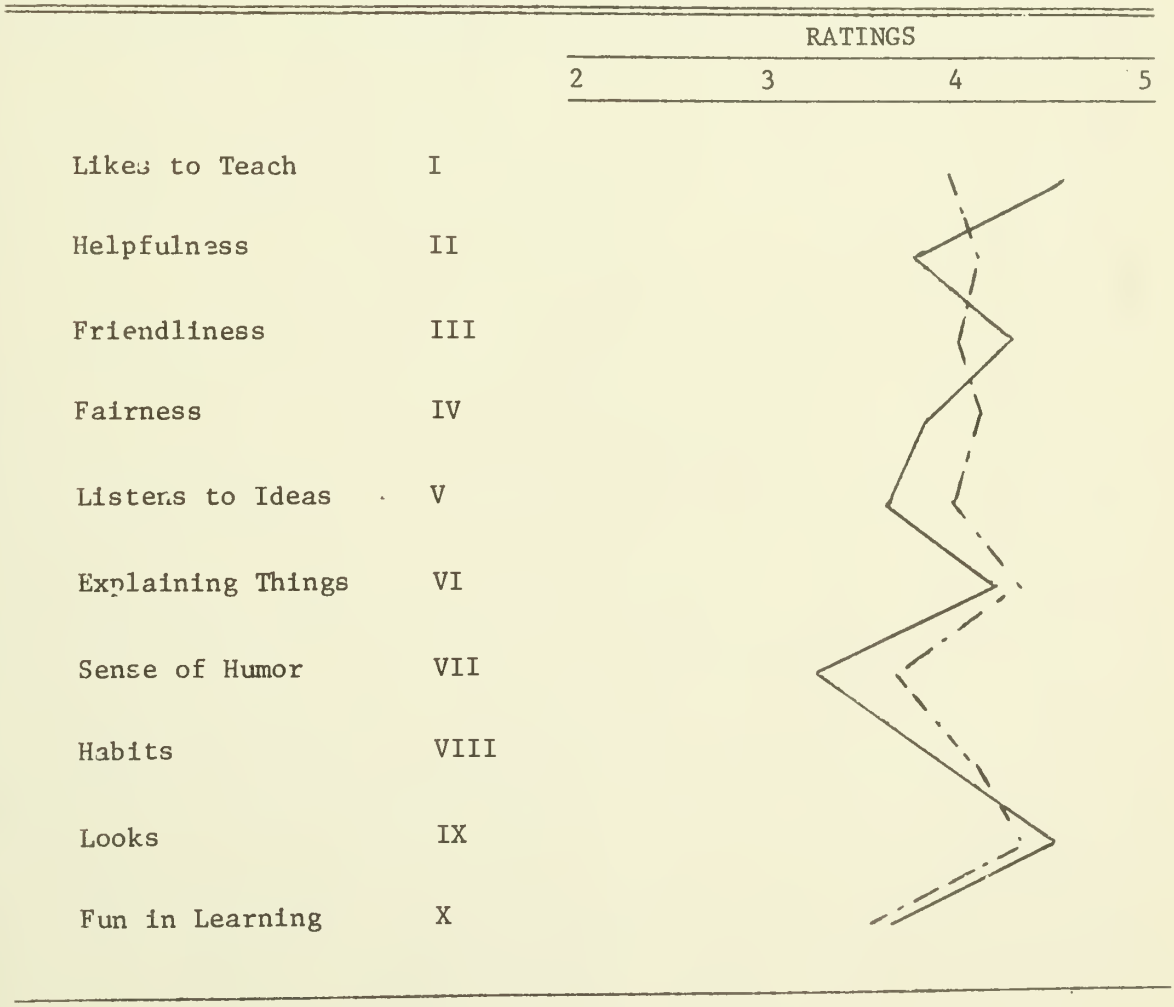
_____ Teacher

_·_·_·_·_ Sample

FIGURE 13

Teacher and Sample Profiles:

CLASS CA1



_____ Teacher

_._._._._ Sample

FIGURE 14

Teacher and Sample Profiles:
CLASS CA2

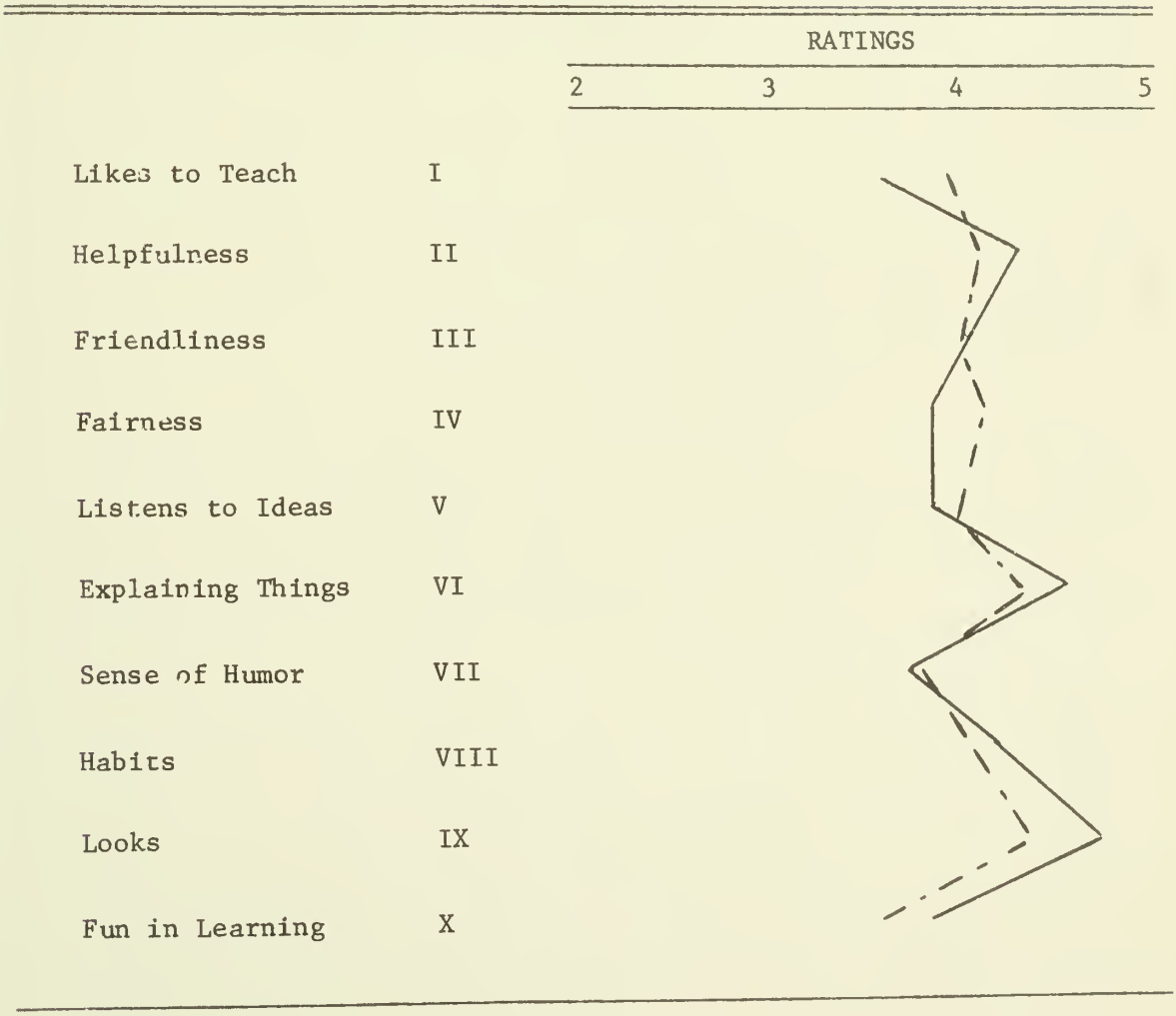


FIGURE 15

Teacher and Sample Profiles:
CLASS CB1

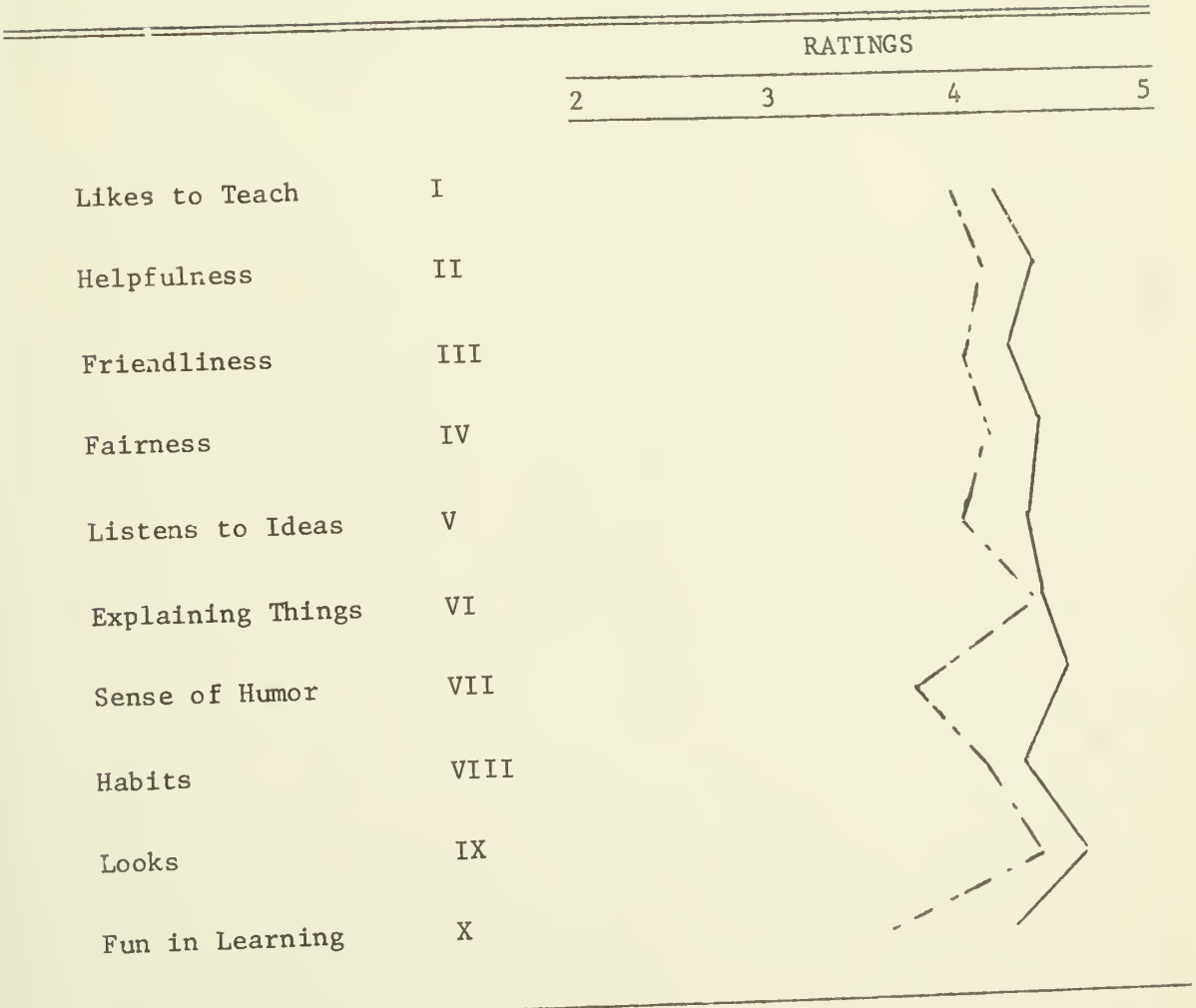
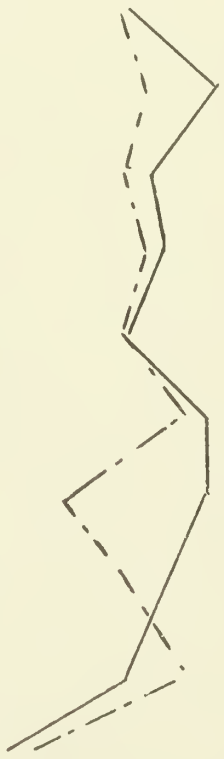


FIGURE 16

Teacher and Sample Profiles:

CLASS CB2

		RATINGS 2 3 4 5
Likes to Teach	I	
Helpfulness	II	
Friendliness	III	
Fairness	IV	
Listens to Ideas	V	
Explaining Things	VI	
Sense of Humor	VII	
Habits	VIII	
Looks	IX	
Fun in Learning	X	



_____ Teacher

_.-.-.-.- Sample

FIGURE 17

Teacher and Sample Profiles:
CLASS IA1

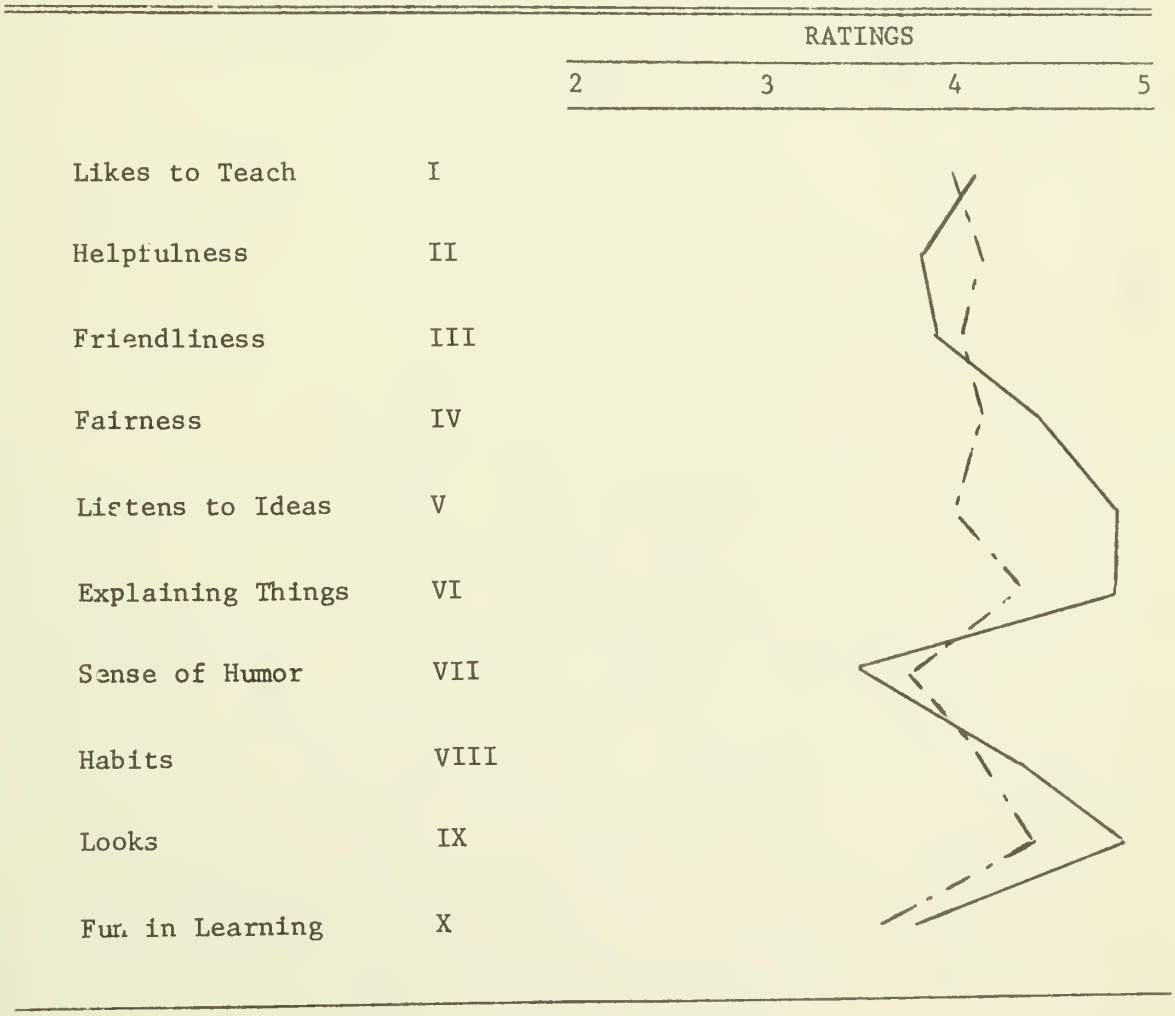


FIGURE 18

Teacher and Sample Profiles:

CLASS IB1

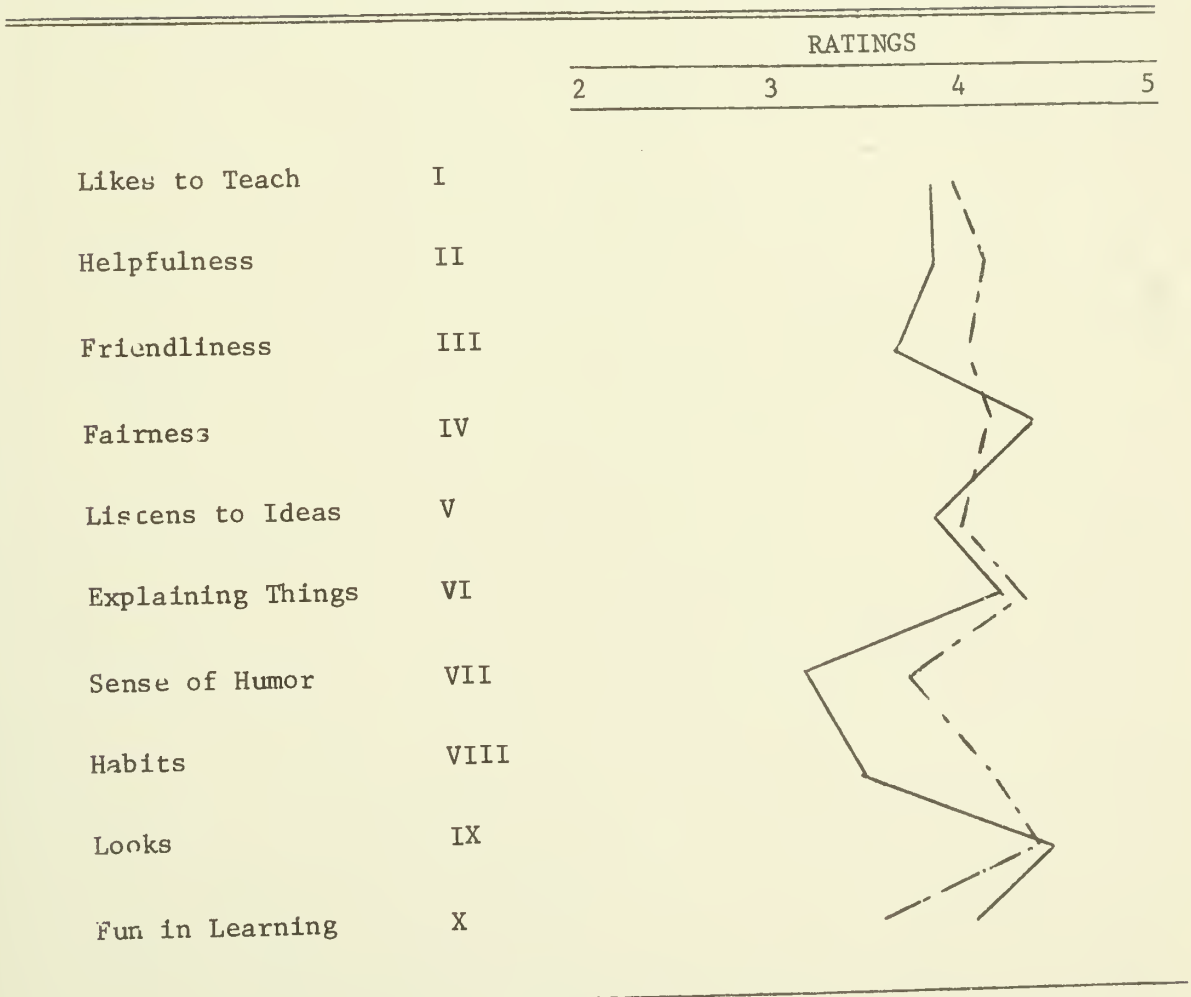
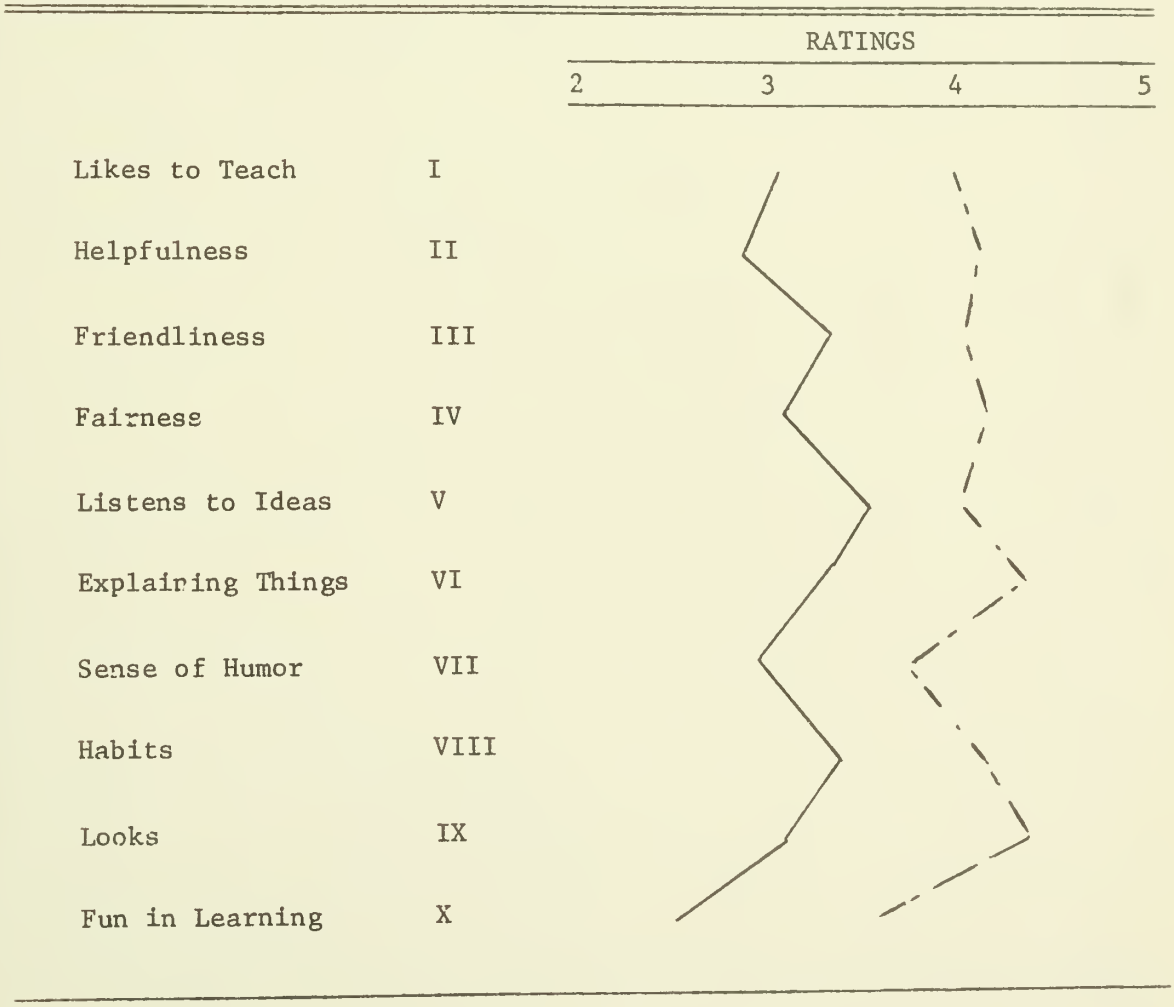


FIGURE 19

Teacher and Sample Profiles:

CLASS IB2

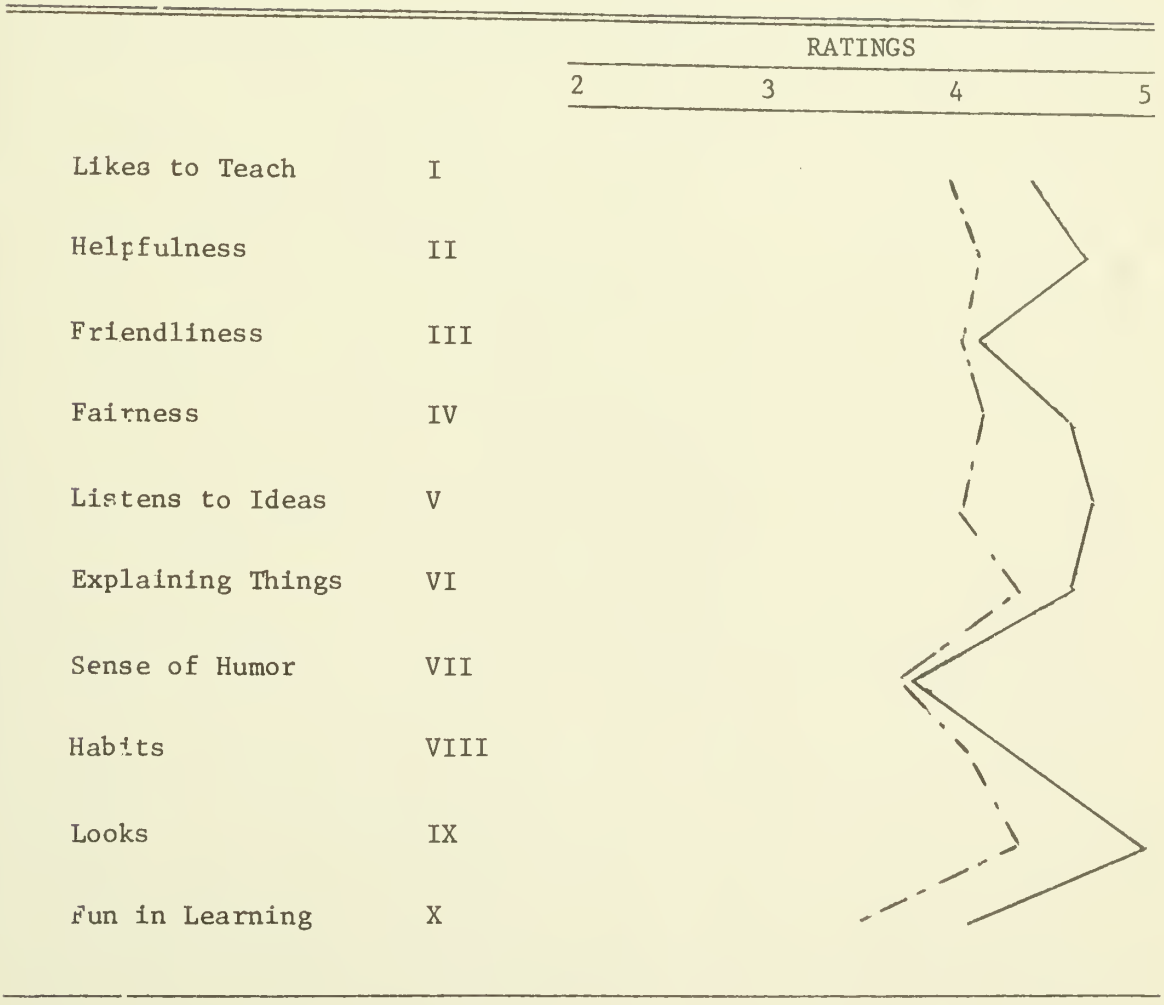


_____ Teacher

_._._._._. Sample

FIGURE 20

Teacher and Sample Profiles:
CLASS IB3



_____ Teacher

_.-.-.-.-. Sample

Mean Class and Sample Responses on All Teaching Behaviors.

Having examined response variance among the various instructional variables, Table 34 presents, in summation, the total sample mean, standard deviation and score range for each of the ten teaching behaviors.

Table 34

Total Sample Mean, Standard Deviation, Maximum Score, Minimum Score and Range of Ratings for Teaching Behaviors

TEACHING BEHAVIORS	MEAN	STANDARD DEVIATION	MAXIMUM SCORE	MINIMUM SCORE	RANGE
I	4.00	0.88	5	1	4
II	4.07	1.00	5	1	4
III	4.04	0.88	5	1	4
IV	4.08	1.05	5	1	4
V	3.98	1.00	5	1	4
VI	4.28	0.90	5	1	4
VII	3.78	1.16	5	1	4
VIII	4.05	1.05	5	1	4
IX	4.31	1.17	5	1	4
X	3.56	1.15	5	1	4

N=500

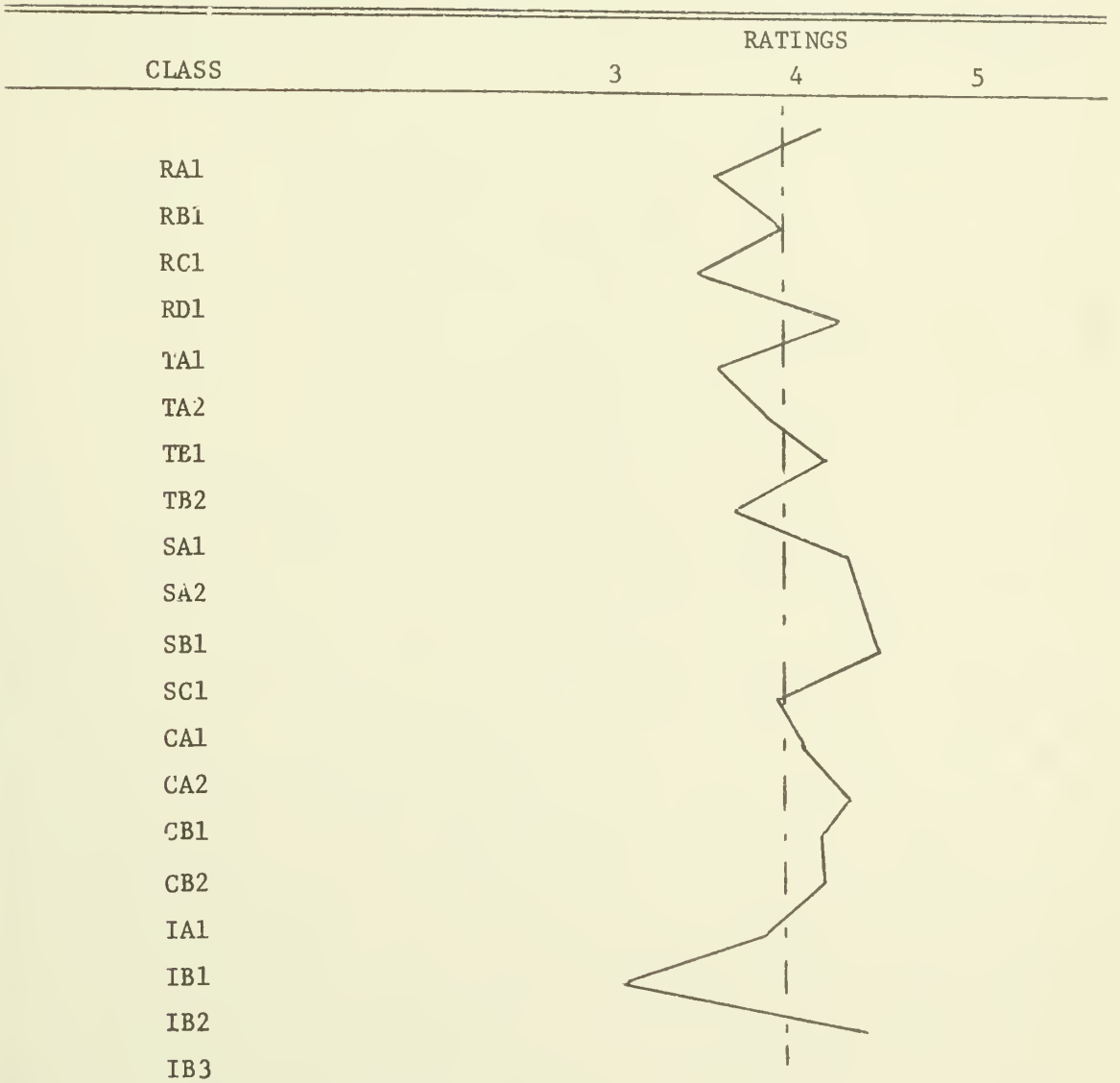
One of the most important statistics to note is the degree of spread in student responses over the entire sample. This is reflected in a range of four, consistently recorded on all variables rated. Also, it will be noted that three behaviors approached a standard deviation of 1.00 while the remaining seven equalled or exceeded it. Behavior IX (Looks) which read, "How often does your teacher dress for school like students think a teach should?", Behavior VII (Sense of Humor) which

read, "How often is your teacher able to take a joke and laugh with the class?" and Behavior X (Fun in learning) which read, "How often does your teacher make school really fun?" discriminated the most among the behaviors rated.

A final description of sample class variance is illustrated in Figure 21. After summing the means on all behaviors, the total class mean was computed and represented in the following figure.

FIGURE 21

Total Sample Class Means Profile



Class Mean

Sample Mean

It should be noted that there was considerable variation among the overall ratings given individual teachers; however, in spite of this variation, these class means fall near the total sample mean of 3.99 and maintain a variance of .13 from this mean. A table of total means can be found in Appendix D, labeled Table XXXI.

Discriminate Analysis Findings

Following the examination of teaching behavior findings, individual student data were classified into the typical and atypical groupings described in Chapter III. The resulting groupings were then subjected to a multiple discriminate stepwise analysis to 1) determine the significance levels of various variables and variable combinations for discriminating among the student rater groups, 2) determine the best variable combination for rater classification and 3) to determine the classification functions of the variables in order to predict group membership of new cases.

Table 35 lists the individual student, teacher and school variables in descending order of F values.

Table 35

Student, Teacher and School Variables
Discriminating Among Rater Groups

VARIABLE	F VALUE
Student Behavior	10.90**
Reading Level	6.46**
Art	6.02**
Language Arts	6.00**
Creativity	4.38*
Total Non-Academic Achievement	4.18*
Total Academic Achievement	3.86*
Music	3.35*
Social Studies	2.95
Science	2.90
Sex of Student	2.76
Intelligence	2.59
Age Range of Teacher	1.87
Math	1.58
Special Services	1.42
School Setting	1.30
Marital Status of Teacher	1.26
Teaching Experience of Teacher	0.98
Educational Level of Teacher	0.53
Sex of Teacher	0.39
Physical Education	0.32
Family Size of Student	0.29
Family Size of Teacher	0.19
Age of Student	0.06

Note: Degrees of freedom 2,497

*p < .05

**p < .01

The single variable identified as differentiating the most among the three rater groups was Student Behavior, with an F value of 10.90, significant at the .01 level. This student variable was subjectively evaluated by teachers by use of a five-point scale which provided for a poor to an outstanding overall classroom behavior assessment (see Appendix C for all demographic data descriptors). Other student achievement and ability variables listed in diminishing order of importance were: Reading Level, Art, Language Arts, Creativity, Total Non-Academic Achievement, Total Academic Achievement, Music, Social Studies, Science, Intelligence, Math and Physical Education. The first non-student variable identified was that of Age Range of Teacher, followed by School Setting, Marital Status of Teacher, Teaching Experience of Teacher, Educational Level of Teacher and Family Size of Teacher. Individual non-student variables failed to reach the .05 level of significance.

As a result of the procedures followed, the next steps reported in the analysis were the result of combining variables having the highest multiple correlation with the rater groups. Table 36 lists the resulting cumulative combinations which discriminated among the groups. All combinations were significant at the .01 level.

Table 36

Discriminating Demographic Variable Combinations

Variables	df	F Value
Student Behavior and Reading Level (+)*	4 992	7.15
Total Academic Achievement (+)	6 990	6.34
Art (+)	8 988	5.32
Marital Status of Teacher (+)	10 986	4.73
School Setting (+)	12 984	4.26
Creativity (+)	14 982	3.88
Special Services (+)	16 980	3.58
Language Arts (+)	18 978	3.29
Age of Student (+)	20 976	3.04
Sex of Teacher (+)	22 974	2.88
Music (+)	24 972	2.71
Teacher Family Size (+)	26 970	2.54
Age Range of Teacher (+)	28 968	2.52
Science (+)	30 966	2.41
Math (+)	32 964	2.31
Social Studies (+)	34 962	2.24
Educational Level of Teacher (+)	36 960	2.15
Intelligence (+)	38 958	2.09
Physical Education (+)	40 956	1.99
Sex of Student (+)	42 954	1.92
Student Family Size (+)	44 952	1.83
Total Non-Academic Achievement (+)	46 950	1.76
Teaching Experience of Teacher	48 948	1.69

NOTE: All F values are significant at the .01 level

*(+) Anticipates the addition of a new variable in the next step.

Figures 22 through 25 present F values related to the equality of group means and case classification matrices for 1) the first variable identified, 2) the best variable combination identified, 3) the next best variable combination for predicting group membership and 4) matrices for all sample variables in combination.

Figure 22

F Value and Case Classification Matrices for Group Discrimination Using Student Behavior As a Variable

F Value			Case Classification		
Group	1	2	1	2	3
2	20.77*	1	12	14	2
3	14.40* 0.58	2	64	199	184
	F (2,497)=10.90* for variable	3	2	11	12
	*p < .01				

The F values presented in Figure 22 indicate that as a demographic variable, Student Behavior resulted in a relatively marked distinction between the positive atypical raters (group 1) and both the typical (group 2) and negative atypical raters (group 3). It should be noted that the differences between groups 2 and 3 were not significant, suggesting that the students who manifested generally satisfactory to negative overall behaviors were less distinguishable as groups than students with highly satisfactory behavior. By adding together the number

of cases classified in the classification matrix, it can be determined that 223 students or 44.6% of the sample were correctly classified using Student Behavior as a single predictor or group membership.

Figure 23 presents the matrices resulting from the combined variable of Student Behavior, Reading Level, and Total Academic Achievement and was the best variable combination for distinguishes among the rater groups.

Figure 23

F Value and Case Classification Matrices for Group Discrimination Using Student Behavior, Reading Level and Total Academic Achievement As a Combination Variable

F Value			Case Classification		
Group	1	2	1	2	3
2	8.69*	1	14	8	6
3	5 43	4.12**	2	97	251	99
	F (6,990)=6.35 for combination variable		3	4	9	12

*p < .01
**p < .05

The combination variable of Student Behavior, Reading Level and Total Academic Achievement resulted in F values which indicated more difference between groups 2 and 3, while at the same time suggesting less distinction between the atypical positive grouping and the other two groupings of student raters. This combination produced the greatest distinction between the typical raters (group 2) and the positive atypical rater (group 1). The distinction between groups 2 and 3 was significant at the .05 level. Of the total sample, 277 cases, representing 55.4% of the sample were properly classified.

Figure 24 presents the next best combination of variables for distinguishing among the rater groups.

Figure 24

F Value and Case Classification Matrices for Group Discrimination Using Student Behavior, Reading Level, Total Academic Achievement, Art, and Marital Status, of Teacher As a Combination Variable

F Value				Case Classification		
Group	1	2		1	2	3
2	5.78*		1	17	7	4
3	4.81*	3.68*	2	105	232	110
	F (10,986)=4.73 for combination variable		3	4	10	11
	*p < .01					

The F value matrix suggests a further equalization of distinction among the groups with the least distinction found between groups 2 and 3 and the most distinction found between groups 1 and 2. Case classification indicated that 260 cases, representing 52% of the sample, were classified correctly using the combination variable of Student Behavior, Reading Level, Total Academic Achievement, Art and Marital Status of Teacher. Because of relatively high and equalized F values, this variable combination was determined to be the second best variable for predicting group membership.

The statistical results of the final variable combination encompassing the entire range of student, teacher, and school variables is presented in Figure 25.

Figure 25

F Value and Case Classification Matrices for Group Discrimination Using a Combination of Total Sample Variables

F Value			Case Classification		
Group	1	2	1	2	3
2	1.64**	1	17	7	4
3	1.58**	1.76**	2	17	276	94
	F (48,948)=1.68* for combination variable	3	2	8	15
	*p .01				
	**p .05				

Analysis of the case classification matrix presented in Figure 25 reveals that of the 500 cases examined, 308, or 61.5% were properly assigned. Examination of the computer program analysis data in Appendix E indicates that once the group distinction was equalized (Step 5), it tended to remain so through the addition of the other nineteen variables.

Tables 37 through 40 present group classification functions for each demographic variable within the combination variables.

Case Classification. In deciding on group membership for new students, the classification functions on the variables can be used along with raw variable scores to predict group membership where α_1 is

a variable classification function and χ_1 is a raw variable score. In each case, the following equation, utilizing the functions presented in Tables 37 through 40, can be used to assign individual students to the group for which the γ score is the largest (Catell, 1966).

$$\gamma_1 = \alpha_1 (\chi_1) + \alpha_2 (\chi_2) + \alpha_3 (\chi_3) \quad . \quad . \quad .$$

Table 37

Student Behavior Variable Classification Functions

Variable	Group 1	2	3
Student Behavior	3.12	4.09	4.26

Table 38

Student Behavior, Reading Level and Total Academic Achievement Variables Classification Functions

Variable	Group 1	2	3
Student Behavior	2.50	3.33	2.64
Reading Level	-0.98	-0.24	-1.49
Total Academic Achievement	1.19	1.06	1.41

Table 39

Student Behavior, Reading Level, Total Academic Achievement, Art, and Marital Status of Teacher Variable Classification Functions

Variable	Group 1	2	3
Student Behavior	1.50	2.34	2.41
Reading Level	-0.74	-0.02	-1.32
Total Academic Achievement	0.76	0.60	0.95
Art	2.75	3.27	3.78
Teacher Marital	6.87	6.71	5.69

Table 40

Total Sample Variable Classification Functions

Variable	Group 1	2	3
1. School Setting	1.21	1.23	0.91
2. Sex of Student	4.59	4.89	4.55
3. Age of Student	23.32	23.60	23.87
4. Student Family Size	0.67	0.62	0.59
5. Student Behavior	3.40	4.30	4.35
6. Art	0.65	1.19	1.68
7. Music	6.16	5.75	6.37
8. Physical Education	4.27	4.47	4.32
9. Creativity	-3.10	-2.93	-3.64
10. Total Non-Academic Achievement	0.14	0.17	0.09
11. Intelligence	9.32	8.76	8.93
12. Language Arts	-0.18	0.65	-1.87
13. Social Studies	1.98	1.67	0.08
14. Math	-2.55	-3.05	-5.11
15. Science	6.76	7.16	4.52
16. Total Academic Achievement	-1.67	-.178	0.80
17. Reading Level	-0.56	0.08	-1.13
18. Teaching Experience of Teacher	-2.73	-2.78	-2.73
19. Sex of Teacher	14.17	14.13	15.11
20. Marital Status of Teacher	16.55	16.62	14.32
21. Teacher Family Size	-0.28	-0.47	0.21
22. Educational Level of Teacher	-0.30	-0.05	0.37
23. Age Range of Teacher	9.49	9.53	8.58
24. Special Services	0.56	0.61	0.62

The importance of these data is that if one can assume that the new students are from populations similar to the sample groups, membership can be predicted (Cooley and Lohnes, 1962), thus making it possible to identify with some degree of certainity the possibility of a given student perceiving his teacher in an atypically positive, negative, or typical way.

C H A P T E R V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR FURTHER RESEARCH

The purpose of this chapter is to bring together the findings of the research, to report conclusions based on these findings and to identify significant additional areas of research suggested by this study.

Summary

Briefly stated, this study has been an investigation into the nature of students' atypical assessment patterns of elementary classroom teaching behavior. A primary concern was the development of a valid and reliable instrument for measuring selected variables of teaching behavior by elementary school children. A secondary concern was to identify, through the use of a rating instrument, the characteristic teaching behavior for each teacher in the sample in order to select students who deviated markedly in their assessments. The students were then grouped as being atypically positive, atypically negative, or typical in their assessment of teaching behavior. Relationships among these groupings and student, teacher and school demographic variables were analyzed to determine which variables might best predict rater group membership.

The findings of the investigation showed: 1) that the Elementary Classroom Teacher Rating Scale developed for the study was acceptably valid and reliable, 2) that individual students within classes varied

in their ratings, thus making it possible to identify typical and atypical rater groups for investigation and 3) that overall, student behavior, as assessed by teachers, discriminated the most among the rater groups. It was further found that student behavior, when combined with various academic and non-academic variables, was significant at the .01 level for predicting rater group membership.

Conclusions

The results of this study clearly indicate that diversity exists among student perceptions of teaching behavior. It is possible, by using selected demographic information, to predict how a student perceives his teacher's overall instructional behavior.

The Elementary Classroom Teacher Rating Scale has demonstrated its potential value and use as an instrument for measuring selected aspects of student perceived environmental press. It would seem to have particular value in pre-service as well as in-service teacher training programs for providing student feed-back on teaching behavior. Administrators, counselors, teachers, and indeed students themselves may see teaching behavior through the eyes of a collective majority and thus note possible areas of concern or improvement. A teacher who is given a low score on Explaining Things could, for example, initiate steps to investigate this areas of concern and encourage student feedback regarding his attempts to improve his instructional behavior, particularly as it might relate to students with unsatisfactory behavior. Another example would be the teacher who is rated low by some students on Helpfulness--

hopefully he would analyze his overall instructional behavior, particularly as it might be directed toward individual children. The specific strategies for altering behavior will, no doubt, vary from teacher to teacher. Overall, however, teacher self-analysis through the use of student feed-back would seem to be not only feasible but practical as well.

Although only two teachers in the sample elicited overall negative student ratings, the size of the sample did not allow the acceptance of these particular profiles as basic categories for special interpretation. The results do, however, suggest that further study is needed before general statements can be made regarding the effectiveness of various behviors and, in turn, their effect on the learning of children.

Implications for Further Research

Measures of educational effectiveness have often been concerned with curricula, cost, physical plant, teacher preparation, etc., but not with student perceptions of the teacher's behavior as part of the overall learning environment. Since behavior is affected by interaction between individuals and their environment, the characteristics of the environment or of the stimulus are as important as the characteristics of the individual (Pace, 1963). This study has attempted, in part, to measure student perceptions of the instructional behavior of teachers.

Studies that would extend the meaning of this research to education include: 1) further investigation of elementary classroom teaching

behavior; 2) revising the instrument, measurement, and data collection procedures used in the study; 3) adapting the instrument to specific subject areas, i.e. music, art, theatre, etc.; 4) examining behavior changes over time; and 5) relating instructional measures to individual characteristics in both students and teachers.

Another suggestion for further research is that the present study be replicated to confirm the validity and reliability of both the instrument and its premises.

Similarly, it is recommended that the present study be expanded in scope so as to include a national cross-section of schools. To this end, the sample should include private schools, parochial schools, a variety of experimental or alternative schools, schools of differing racial composition, and schools in various regions of the country. A greater sample would, of course, allow the establishment of wider, more meaningful norms and also allow the determination of specific instructional patterns allowing for a greater degree of confidence in the effect of selected teaching behaviors on student learning.

Greater attention should also be given to collecting objective measures of achievement. As a major concern of this study was to develop the teaching behavior assessment instrument, less attention was given to securing objective measures of student achievement that would normally be desirable. However, there is some evidence to indicate that the teacher's subjective assessment or beliefs regarding a student's achievement and ability is more important in the learning situation than more objective data.

Such research as that outlined above would enable future investigators to deal more confidently with the educational environment as it facilitates learning. Therefore, a study of a logitudinal nature, with the intention of measuring various patterns of instructional behavior and changes in instructional behavior, would be both appropriate and informative. Questions which need to be answered include: (1) Do teachers really want to know how students see them as teachers? (2) Are teachers interested in meeting instructional standards on administrator terms or on student terms? (3) Which aspects of instructional behavior are most difficult to change? (4) Can teacher and student perception of behavior discrepancies be reduced? (4) What is the effect that various student-perceived behaviors have on learning? (5) Do positive changes in one teaching behavior significantly affect other student perceptions? Completion of the present study has further emphasized the need to investigate the nature of instructional behavior and its possible affect on the learning of individual students.

As mentioned in Chapter I, once adequate teaching behavior measurement has been accomplished, investigators can deal more accurately with variables of achievement as factors responding to the instructional setting. Analysis may then be made of those patterns of press which seem to be more successful with given student compositions. For example, Jensen (1969) indicated that there is evidence to show that the diversity of mental abilities is a basic fact of nature and adds that equal educational opportunity must, therefore, not be interpreted as uniformity of facilities, aims, and techniques but quite the opposite. Schools must

provide a diversity of programs, teaching styles and opportunities so as to complement the diversity in human responsiveness and needs. To this end, the instructional behavior of teachers will continue to be an important component of the educational process.

Further study of educational environments will need to explore new dimensions. More comprehensive analysis needs to be made of the cultural aspirations and biases of teachers as well as of the cultural characteristics of students. Other factors of the environment that need to be considered are the attempts at and the results of various educational innovations on the behavior and learning of students.

In referring to earlier chapters which dealt with the theoretical base of the study, it is appropriate to recall the interaction between environment and behavior as described by Anastasi (1958), Jones (1968), Schutz (1960), and Murray (1938). In doing so, it appears clear that widely differing student behaviors in various classrooms may indeed be related to individual classroom environments and teaching behaviors and subsequent student perceptions of those environments. It may also be inferred that a relationship exists between the degree of involvement in the environment and the perception of the environment which ultimately determines behavior.

As mentioned in the Encyclopedia of Educational Research (Harris [ed.], 1960), research supports the notion that interpersonal relationships in the school setting affect both the qualitative and quantitative aspects of learning. An important climate dimension is the degree of rapport between students and teachers. The social and academic atmosphere

for learning is generally a function of the personal attributes of the teachers and the school as a whole. These behaviors or conditions basically reflect the school administration and its patterns of supporting or discouraging the instructional behaviors of its teachers.

APPENDICES

APPENDIX A

VALIDITY ASSESSMENT INSTRUMENTS AND ADMINISTRATOR INTRODUCTION GUIDELINES

DESIGN VALIDITY ASSESSMENT

Evaluator:_____Date_____

The objective of this assessment is to estimate the validity of the attached Elementary Classroom Teacher Rating Scale. Because there is no suitable criteria with which to compare the instrument, the validity will be estimated by judgmental means. Given the purpose, description of the sample, administration procedures, and behaviors to be rated, the evaluator will be asked to indicate acceptance or rejection of: 1) the clarity of the instructions, 2) the likelihood of the procedures assuring optimum results, and 3) the validity of each of the ten teaching behaviors selected for the instrument.

PURPOSE OF THE INSTRUMENT

The purpose of the rating scale is to provide a means for upper grade elementary school children to rate the frequency with which their teacher demonstrates certain instructional behaviors. The investigator is seeking to study the characteristics of students exhibiting atypical rating patterns. The purpose of the over-all investigation is to study student characteristics, not teacher behaviors.

The Instrument. The Purdue Rating Scale for Instruction, considered by many to be a valid and reliable instrument for rating college and university teaching, has been modified for this study. On the basis of evaluations drawn from the School of Education faculty, elementary school administrators and instructional staffs, and fifth and sixth grade pupils, the rating instrument has undergone several revisions. The present pilot version has been analyzed using the Lorge readability formula and the over-all vocabulary is estimated to be grade 3.5.

The Purdue instructional behavior categories and their elementary classroom teaching revisions have been listed below. Behavioral cues cited in the original instrument and the procedures outlined above have been used to arrive at the revised categories.

	PURDUE RATING CATEGORIES		REVISED RATING CATEGORIES
1.	Interest in Subject	1.	Likes to Teach
2.	Sympathetic Attitude toward Students	2.	Helpfulness (and)
		3.	Friendliness
3.	Fairness in Grading	4.	Fairness
4.	Liberal and Progressive Attitude	5	Listens to Ideas
5.	Presentation of Subject Matter	6.	Explaining Things
6.	Sense of Proportion and Humor	7.	Sense of Humor
7.	Self-reliance and Confidence	0.	(Judged invalid for sample)
8.	Personal Peculiarities	8.	Habits
9.	Personal Appearance	9.	Looks
10.	Stimulates Intellectual Curiosity	10.	Fun in Learning

SAMPLE POPULATION

The instrument will be administered to selected fifth and sixth grade students in the New England region representing wide variations in socio-economic backgrounds. Rural, town, suburban, city and inner-city populations will be included in the sample.

ADMINISTRATION PROCEDURES

After securing the understanding and cooperation of school administrators and teachers, the instrument will be administered to fifth and sixth grade classes. The mid-morning hours are considered preferable and the teachers will not be present during the rating period. Anonymity will be assured, both for pupils and teachers. Directions for marking the scale will be read out loud and explained. Assistance will be given to students identified by the teachers as having reading difficulties.

In order to meet the objective of this assessment schedule, true-false responses are requested to the two questions which follow. Please place a check ( ) in the appropriate box. In answering, consideration should be given to: 1) the purpose of the instrument, 2) the sample population, and 3) the administration procedures.

	Yes	No
1. Examine the rating scale and read the instructions. In your judgment, are the directions for marking clear and appropriate for the projected sample?	___	___
COMMENTS:_____	___	___
2. Are the outlined classroom administration procedures and conditions satisfactory for assuring optimum results?	___	___
COMMENTS:_____	___	___

Validity is generally concerned with the question of whether or not an item will measure what it is intended to measure. Consider the purpose and the sample population, are students likely to be able to rate the following?

	YES	NO
1. LIKES TO TEACH		
How often does your teacher seem to be glad to be teaching school?	___	___
COMMENTS:_____	___	___
2. HELPFULNESS		
How often does your teacher take time to help students when they want help?	___	___
COMMENTS:_____	___	___
3. FRIENDLINESS		
How often does your teacher smile at students and do nice things?	___	___
COMMENTS:_____	___	___
4. FAIRNESS		
How often does your teacher try to be fair to students?	___	___
COMMENTS:_____	___	___
5. LISTENS TO IDEAS		
How often does your teacher take time to listen carefully to student's ideas?	___	___
COMMENTS:_____	___	___
6. EXPLAINING THINGS		
How often does your teacher explain things so that students really understand what they are to do?	___	___
COMMENTS:_____	___	___
7. SENSE OF HUMOR		
How often does your teacher seem to be able to take a joke and laugh with the class?	___	___
COMMENTS:_____	___	___
8. HABITS		
How often does your teacher do something that make the class feel uneasy?	___	___
COMMENTS:_____	___	___
9. LOOKS		
How often does your teacher dress like teachers should dress?	___	___
COMMENTS:_____	___	___
10. FUN IN LEARNING		
How often does your teacher make learning in school really fun?	___	___
COMMENTS:_____	___	___

FACE VALIDITY ASSESSMENT

Student evaluator_____Date_____

For use by investigator only

Date of birth_____Age_____Sex M F I.Q._____Grade 5 6
School_____City_____State_____
Number of children in family_____Racial or Ethnic background_____
Father's occupation_____
Mother's occupation_____
COMMENTS:_____

Interview Conditions

Time: Mid-morning Situation: Individual interview Duration: ten min.
Location: Classroom Materials: Sample booklet, pencil, assessment forms

I have a few questions I'd like to ask you to find out how you felt about the rating scale you marked this morning. This is not a test and I will not show or tell anyone what you have said. O.K.?

	Accept	Reject
1. What did I want to learn by asking you to mark the rating booklet?	___	___
COMMENTS:_____	___	___
2. Tell me, what you were supposed to do?	___	___
COMMENTS:_____	___	___
3. If you changed your mind after making an X, what could you do?	___	___
COMMENTS:_____	___	___

Good, now let's talk about teachers and some of the things you may have noticed about teachers.

1. Can you tell if a teacher likes to teach school?	___	___
How?	___	___
COMMENTS:_____		

How often is your teacher happy about teaching school?

	Accept	Reject
2. Can you tell when a teacher tries to be helpful?	___	___
How?	___	___
COMMENTS:_____		
How often does your teacher take time to help students when they want help?		
3. Can you tell when a teacher is friendly? How?	___	___
COMMENTS:_____	___	___
How often is your teacher friendly to students?		
4. Can you tell when a teacher is fair to students?	___	___
How?	___	___
COMMENTS:_____		
How often is your teacher fair to students?		
5. Can you tell when a teacher is really listening to student's ideas? How?	___	___
	___	___
COMMENTS:_____		
How often does your teacher take time to listen carefully to student's ideas?		
6. Can you tell when a teacher explains things clearly so that student's know what to do? How?	___	___
	___	___
COMMENTS:_____		
How often does your teacher explain things so that students really understand what to do?		
7. Can you tell when a teacher has a good sense of humor? How?	___	___
	___	___
COMMENTS:_____		
How often is your teacher able to take a joke and laugh with the class?		
8. Can you tell when a teacher has some habits which bother students? How?	___	___
	___	___
COMMENTS:_____		
How often does your teacher do something that really bothers the class?		
9. Can you tell when a teacher dresses right for school? How?	___	___
	___	___
COMMENTS:_____		
How often does your teacher dress for school like students think teachers should?		
10. Can you tell if you are learning and doing better in school? How?	___	___
	___	___
COMMENTS:_____		
How often does your teacher make school really fun?		

PUPIL ASSESSMENT OF
ELEMENTARY CLASSROOM TEACHING BEHAVIOR:
A STUDY OF ATYPICAL RATINGS

Introduction Guidelines

Please use the following guidelines for introducing the instrument administrator:

1. I am pleased to introduce _____ who is working on a special project.

2. We have talked about the things he is going to ask you to do and I want you to: a) be as honest as you can and
   b) give your complete cooperation.

3. _____ has assured me that no one will be shown what you have written---not even me.

4. He/she will answer any questions you may have after an explanation of what you are to do has been made.

5. I'll be back when you have finished and we will carry on with out work.

APPENDIX B

ELEMENTARY CLASSROOM TEACHER RATING SCALE

ELEMENTARY CLASSROOM
TEACHER RATING SCALE

_ _ _ _ _ _ ID

5

INSTRUCTIONS

We all have our own special feelings about people and things. Because you are with your teacher during much of the day, you probably have noticed many different things about your teacher, just as your teacher has noticed many different things about you.

Your answers on the following 10 pages in this booklet will help to give some idea of what you have noticed.

This is not a test and no one will be shown what you have written.

WHAT TO DO

Read the heading and the question at the top of the page. After carefully thinking about it, make an X in the box nearest the words that tell *how much* or *how often*. When you have finished, go on to the next question.

Take your time and make an X in only one box on each page. If you change your mind, erase the X and place another one where you think it should be. Make sure that you have marked every page.

When you have re-checked all 10 pages, close your booklet and raise your hand. There is to be no talking until everyone has finished and the booklets have been collected.

After doing the following example, you should understand how to mark your answers.

Example: HOMEWORK

How often does your teacher give homework?

- ☐ *All* of the time.
- ☐ *Most* of the time.
- ☐ About *Half* of the time.
- ☐ *Some* of the time.
- ☐ *None* of the time.

Do you have any questions about what you are to do?

Remember, this is not a test and no one will be shown what you have written.

Now you should be ready to mark each of the 10 pages in this booklet.

Please turn the page and begin.

That's all! Now go back and read over the questions and your answers. You may change your answers if you wish.

When you have finished, close your booklet and raise your hand.

Remember, there is to be no talking until everyone has finished and the booklets have been collected.

Thank you very much.

1. LIKES TO TEACH

How often is your teacher happy about teaching school?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

10. FUN IN LEARNING

How often does your teacher make school really fun?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

9. LOOKS

How often does your teacher dress for school like students think teachers should?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

2. HELPFULNESS

How often does your teacher take time to help students when they want help?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

3. FRIENDLINESS

How often is your teacher friendly to students?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

8. HABITS

How often does your teacher do something that really bothers the class?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

7. SENSE OF HUMOR

How often is your teacher able to take a joke and laugh with the class?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

4. FAIRNESS

How often is your teacher fair to students?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

5. LISTENS TO IDEAS

How often does your teacher take time to listen carefully to student's ideas?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

6. EXPLAINING THINGS

How often does your teacher explain things so that students really understand what to do?

- ☐ *ALL* of the time.
- ☐ *MOST* of the time.
- ☐ About *HALF* of the time.
- ☐ *SOME* of the time.
- ☐ *NONE* of the time.

APPENDIX C

CLASS LIST, DEMOGRAPHIC DATA COLLECTION FORMS, AND CODED VARIABLES

#2A

CLASS LIST

__ __ __ ID (Setting, School, and Class)

Please record the names of the students in your class beside the numbers listed below. This list is to be used for correlating names with pupil demographic data (form #2B).

In addition, please place an asterisk (*) beside the name of any students who may have severe reading, language, or perceptual problems.

Place two asterisks (**) beside the name of any student who has not been in your class for at least one semester.

ID Number	Name	ID Number	Name
01-		26-	
02-		27-	
03-		28-	
04-		29-	
05-		30-	
06-		31-	
07-		32-	
08-		33-	
09-		34-	
10-		35-	
11-		36-	
12-		37-	
13-		38-	
14-		39-	
15-		40-	
16-		41-	
17-		42-	
18-		43-	
19-		44-	
20-		45-	
21-		46-	
22-		47-	
23-		48-	
24-		49-	
25-		50-	

#1A

SCHOOL DEMOGRAPHIC DATA FORM

__ __ ID (Setting and School)

Please write answers in this column:

*(66-67)*_____1. How many elementary schools are there in this community?

*(68)*_____2. What grade levels are taught in this school?

1=K-5
2=K-6
3=K-8
4=1-6
5=3-6
6=4-6
7=5-6
8=6-8
9=other:_____(please specify)

*(69-70)*_____3. How many classrooms are there in this school?

*(71-72)*_____4. How many certified classroom teachers are there in this school?

*(73)*__ __5. How many special teachers serve this school? (Music, Art, Speech, etc.)

*(74-75)*_____6. What is the age of the plant?

*(76-77-78)*_____7. What is the total student population of this school?

*(79-80)*_____8. How long has the principal held his present assignment?

9. What is the racial or ethnic make-up of the school?

_____% American Indian
_____% Negro
_____% Oriental
_____% Spanish-surnamed
_____% White

THANK YOU!

#1B

TEACHER DEMOGRAPHIC DATA FORM

___ ___ ___ ID (Setting, School and Class) 01-____ (Number of students)

Please write answers in this column:

*(48-49)*_____1. How many years have you taught school?

*(50-51)*_____2. How many years have you taught in this school?

*(52)*_____3. What grade level do you currently teach? (F=5th, S=6th)

*(53-54)*_____4. How many years have you taught this grade in this school?

*(55)*_____5. Sex: (M=male, F=female)

*(56)*_____6. Marital status: (S=single, M=married)

*(57-58)*_____7. How many children do you have? (0+)

*(59)*_____8. Racial or ethnic background: (A=American Indian, N=Negro, O=Oriental, S=Spanish-surnamed, W=White)

*(60)*_____9. Highest educational level: (1=less than Bachelor's, 2=Bachelor's, 3=Bachelor's plus, 4=Master's, 5=Master's plus, 6=Doctorate, 7=Doctorate plus)

*(61-62)*____10. Year last degree obtained?

*(63)*____11. Age range: (1=20-24, 2=25-29, 3=30-34, 4=35-39, 5=40-44, 6=45-49, 7=50-54, 8=55-59, 9=60+)

*(64)*____12. Do you reside in the immediate area serving the school you teach in?
(65)

(Y=yes, N=no)

THANK YOU!

#2B

PUPIL DEMOGRAPHIC DATA FORM

(1-5) __ __ __ __ __ ID (Setting, School, Class, and Students) (6)

(7-16) __ __ __ __ __ __ __ __ __ __ (17) (18-19) __ __ (20)

Please correlate pupil demographic data with CLASS LIST (#2A) *prior to scale administration*

(21)____ Grade:(5 or 6) (22)____ Sex:(M=male, F=female) (23-24)____ Age:(nearest year)

(25)____ Racial or ethnic background: (A=American Indian, N=Negro, O=Oriental, S=Spanish-surnamed, W=White)

(26-27)____ Number of children in family

(28-29)____ Father's occupation

(30-31)____ Mother's occupation

} *See* Vocational Coding Sheet

Considering the total classroom population you are currently teaching, please subjectively assess the student described in this form by placing a (✓) in the space below the appropriate descriptive term.

(32)____ BEHAVIOR	*Poor*	*Below Av.*	*Average*	*Above Av.*	*Outstanding*
(33)____ ART	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(34)____ MUSIC	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(35)____ PHYSICAL EDUC.	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(36)____ CREATIVITY	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(37-38)_____					
(39)____ INTELLIGENCE	*Retarded*	*Slow*	*Average*	*Bright*	*Exceptional*
(40)____ LANGUAGE ARTS	*Poor*	*Weak*	*Average*	*Bright*	*Outstanding*
(41)____ SOCIAL STUDIES	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(42)____ MATHEMATICS	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(43)____ SCIENCE	*Poor*	*Weak*	*Average*	*Strong*	*Outstanding*
(44-45)_____					
(46)____ READING LEVEL	*Remedial*	*Below Grade*	*Grade Level*	*Above Grade*	*Outstanding*

THANK YOU!

#2C

VOCATIONAL CODING SHEET

The following vocational categories and examples will be helpful in classifying the occupations of your student's parents. You will note that most fields employ personnel requiring a wide range of skills and/or training; therefore, there will be much category overlapping in each vocational field. You need only decide which category best represents the occupation of each parent and record it on each STUDENT DEMOGRAPHIC DATA FORM (#2B).

VOCATIONAL CATEGORIES	*FIELD EXAMPLES*
01=HOUSEWIFE	
02=PROFESSIONAL	Medical, Educational, Religious, Scientific, Legal, Artistic, Technical, Commercial, etc.
03=SEMI-PROFESSIONAL	Business, Sales, Transport, Insurance, Social, etc.
04=SKILLED	Clerical, Mechanical, Secretarial, Electrical, Publishing, etc.
05=SEMI-SKILLED	Construction, Manufacturing, Agricultural, Services, etc.
06=UNSKILLED	Custodial, Labor, Domestic, etc.
07=NOT IN HOME	
08=DECEASED	
09=UNKNOWN	

THANK YOU!

DISSERTATION STUDY VARIABLES

Variable Number	Card Column	Name of Variable
ID	(1-5)	Setting, School, Class and Student Number
1	(7)	Likes to Teach (5 frequency categories)
2	(8)	Helpfulness "
3	(9)	Friendliness "
4	(10)	Fairness "
5	(11)	Listens to Ideas "
6	(12)	Explaining Things "
7	(13)	Sense of Humor "
8	(14)	Habits "
9	(15)	Looks "
10	(16)	Fun in Learning "
11	(18-19)	Total Assessment Ratings
12	(21)	Grade (5 or 6)
13	(22)	Sex (M=male, F-female)
14	(23-24)	Age (nearest year)
15	(25)	Racial or Ethnic Background (6 categories) A=American Indian N=Negro O=Oriental S=Spanish-surnamed W=White U=Unknown
16	(26-27)	Number of children in family
17	(28-29)	Father's occupation (See Vocational Coding Sheet)
18	(30-31)	Mother's occupation "
19	(32)	Behavior (5 rating categories)
20	(33)	Art "
21	(34)	Music "
22	(35)	Physical Educ. "
23	(36)	Creativity "
24	(37-38)	Total of column 33-36 "
25	(39)	Intelligence "
26	(40)	Language Arts "
27	(41)	Social Studies "
28	(42)	Mathematics "
29	(43)	Science "
30	(44-45)	Total of colum 40-43 "
31	(46)	Reading Level "
32	(48-49)	Years taught
33	(50-51)	Years taught in sample school
34	(52)	Grade level currently teaching
35	(53-54)	Years taught sample classroom
36	(55)	Sex (M=male, F=female)
37	(56)	Marital status (S=single, M=married)
38	(57-58)	Number of children
39	(59)	Racial or Ethnic Background (6 categories, see 25 above)
40	(60)	Highest educational level (7 categories)

Variable Number	Card Column	Name of Variable
		1=less than Bachelor's 2=Bachelor's 3=Bachelor's plus 4=Master's 5=Master's plus 6=Doctorate 7=Doctorate plus
41	(61-62)	Year last degree obtained
42	(63)	Age range (9 categories) 1=20-24 2=25-29 3=30-34 4=35-39 5=40-44 6=45-49 7=50-54 8=55-59 9=60+
43	(64)	Area residence serving school? (Y=yes, N=no)
44	(66-67)	Number of elementary schools in community
45	(68)	Grade levels taught in school (9 categories) 1=K-5 2=K-6 3=K-8 4=1-6 5=3-6 6=4-6 7=5-6 8=6-8 9=other
46	(69-70)	Number of classrooms in school
47	(71-72)	Number of certified classroom teachers in school
48	(73)	Number of special teachers serving school
49	(74-75)	Age of plant
50	(76-77-78)	Total student population of school
51	(79-80)	Number of years principal assigned to school

APPENDIX D

FREQUENCY AND PERCENT DISTRIBUTION BY TEACHING VARIABLES; AND CLASS AND SAMPLE BEHAVIOR MEANS

Table I

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR I: LIKES TO TEACH

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	9	3	5	7	7	3	7	4	1	11	11	8	14	5	8	8	10	7	3	11
4	12	10	21	11	20	14	7	12	15	15	14	15	10	13	20	17	10	9	3	11
3	3	4	2	2	1	9	2	3	8	2	2	0	1	6	2	4	2	1	5	0
2	4	4	0	1	0	2	0	0	2	2	0	0	0	2	0	1	3	5	6	1
1	0	0	0	1	0	0	1	0	1	0	0	0	0	2	0	0	0	0	1	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	32	14	18	30	25	11	41	21	4	37	41	35	56	18	27	27	40	32	17	48
4	43	48	75	48	71	50	41	63	56	50	52	65	40	46	67	57	40	41	17	48
3	11	19	7	13	4	32	12	16	30	7	7	0	4	21	7	13	8	5	28	0
2	14	19	0	4	0	7	0	0	7	7	0	0	0	7	0	3	12	23	33	4
1	0	0	0	4	0	0	6	0	4	0	0	0	0	7	0	0	0	0	6	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table II

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR II: HELPFULNESS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	5	7	11	5	11	5	5	13	12	17	10	14	5	16	16	17	9	6	1	16
4	18	8	11	5	14	15	9	5	7	9	11	7	15	7	12	11	8	9	6	6
3	3	4	4	6	2	5	2	1	2	1	4	1	1	3	1	2	2	4	4	1
2	1	2	1	7	2	3	0	0	6	3	2	1	3	2	1	0	6	3	4	0
1	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	3	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	18	33	39	22	39	28	29	68	44	57	37	61	20	57	53	57	36	27	6	70
4	64	38	39	22	50	54	53	26	26	30	41	30	60	25	40	37	32	41	33	26
3	11	19	14	26	7	28	12	5	7	3	15	4	4	11	3	7	8	18	22	4
2	4	10	4	30	7	11	0	0	22	10	7	4	12	7	3	0	24	14	22	0
1	4	0	4	0	0	0	6	0	0	0	0	0	4	0	0	0	0	0	17	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table III

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR III: FRIENDLINESS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	12	2	7	2	15	3	7	7	12	8	15	11	11	9	10	10	7	6	1	6
4	13	9	17	10	13	16	6	12	7	20	12	10	11	14	19	15	11	8	6	14
3	3	6	4	8	0	5	0	0	2	1	0	2	2	3	0	5	4	2	4	2
2	0	3	0	2	0	4	2	0	6	1	0	0	1	2	1	0	3	6	4	1
1	0	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	43	10	25	9	54	11	41	37	44	27	56	48	44	32	33	33	28	27	6	26
4	46	43	61	43	46	57	35	63	26	67	44	43	44	50	63	50	44	36	33	61
3	11	29	14	35	0	28	0	0	7	3	0	9	8	11	0	17	16	9	22	9
2	0	14	0	9	0	14	12	0	22	3	0	0	4	7	3	0	12	27	22	4
1	0	5	0	4	0	0	12	0	0	0	0	0	0	0	0	0	0	0	17	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table IV

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR IV: FAIRNESS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	9	6	4	2	16	8	5	8	5	14	19	19	7	12	16	10	14	12	2	17
4	14	8	14	5	12	12	7	6	15	12	6	2	11	7	11	17	8	8	7	3
3	4	5	4	10	0	5	2	4	3	2	2	2	3	3	2	3	2	0	4	2
2	0	2	6	5	0	1	2	1	3	2	0	0	4	5	1	0	1	2	5	1
1	1	0	0	1	0	2	1	0	1	0	0	0	0	1	0	0	0	0	0	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	32	29	14	9	57	29	29	42	19	47	70	83	28	43	53	33	56	55	11	74
4	50	28	50	22	43	43	41	32	56	40	22	9	44	25	37	57	32	36	39	13
3	14	24	14	43	0	28	12	21	11	9	7	9	12	11	7	10	8	0	22	9
2	0	10	21	22	0	4	12	5	11	7	0	0	16	18	7	0	4	9	28	4
1	4	0	0	4	0	7	6	0	4	0	0	0	0	4	0	0	0	0	0	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table V

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR V: LISTENS TO IDEAS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	11	6	7	0	9	11	5	11	12	9	12	6	4	9	13	7	15	8	7	18
4	13	7	15	11	18	11	2	5	6	15	10	8	12	9	14	18	8	6	1	3
3	2	5	4	5	1	3	2	1	4	2	2	9	5	6	2	4	1	4	2	2
2	2	3	0	5	0	3	2	2	4	4	2	0	4	4	1	1	0	4	2	0
1	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	1	0	6	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	39	29	32	0	32	39	29	58	44	30	44	26	16	32	43	23	60	36	39	78
4	46	33	54	48	64	39	12	26	22	50	37	35	48	32	47	60	32	27	6	13
3	7	24	14	22	4	11	12	5	15	7	7	39	20	21	7	13	4	18	11	9
2	7	14	0	22	0	11	12	11	15	13	7	0	16	14	3	3	0	18	11	0
1	0	0	0	4	0	0	6	0	4	0	4	0	0	0	0	0	4	0	33	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table VI

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR VI: EXPLAINING THINGS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	13	2	11	10	12	7	9	10	6	20	12	18	9	18	13	16	20	10	7	16
4	11	12	7	0	14	13	6	6	9	10	13	5	12	7	14	12	5	9	1	4
3	2	1	9	3	2	6	0	3	1	0	1	0	3	2	2	2	0	0	2	3
2	2	3	1	2	0	1	1	0	9	0	0	0	1	1	0	0	0	3	2	0
1	0	3	0	0	0	1	1	0	2	0	0	0	0	0	1	0	0	0	6	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	46	10	39	43	43	25	53	53	22	67	48	78	36	64	43	53	80	45	39	70
4	39	57	25	39	50	46	35	32	33	33	48	22	48	25	47	40	20	41	6	17
3	7	5	32	13	7	21	0	16	4	0	4	0	12	7	7	7	0	0	11	13
2	7	14	4	9	0	4	6	0	33	0	0	0	4	4	0	0	0	14	11	0
1	0	14	0	0	0	4	6	0	7	0	0	0	0	0	3	0	0	0	33	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table VII

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR VII: SENSE OF HUMOR

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	21	1	8	1	9	3	8	4	14	11	11	10	2	6	23	17	7	2	0	6
4	6	5	10	7	15	9	3	12	10	14	14	11	12	12	3	10	8	7	8	11
3	1	4	5	4	2	5	1	1	1	2	0	2	2	7	0	3	2	6	3	1
2	0	8	5	9	2	7	4	2	2	3	2	0	8	2	3	0	8	6	5	5
1	0	3	0	2	0	4	1	0	0	0	0	0	1	1	1	0	0	1	2	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	75	5	29	4	32	11	47	21	52	37	41	43	8	21	77	57	28	9	0	26
4	21	24	36	30	54	32	18	63	37	47	52	48	48	43	10	33	32	32	44	48
3	4	19	18	17	7	28	6	5	4	7	0	9	8	25	0	10	8	27	17	4
2	0	38	18	39	7	25	24	11	7	10	7	0	32	7	10	0	32	27	28	22
1	0	14	0	9	0	14	6	0	0	0	0	0	4	4	3	0	0	5	11	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table VIII

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR VIII: HABITS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	10	5	7	1	16	6	7	9	9	18	19	15	8	10	14	12	15	6	5	9
4	10	9	15	13	10	11	6	10	12	11	6	8	11	14	10	14	4	6	6	12
3	5	0	5	7	2	8	0	0	1	1	2	0	3	3	4	3	4	4	1	2
2	1	6	1	1	0	2	2	0	5	0	0	0	1	0	1	1	2	3	2	0
1	2	1	0	1	0	1	2	0	0	0	0	0	2	1	1	0	0	3	4	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	36	24	25	4	57	21	41	47	33	60	70	65	32	36	47	40	60	27	28	39
4	36	43	54	57	36	39	35	53	44	37	22	35	44	50	33	47	16	27	33	52
3	18	0	18	30	7	29	0	0	4	3	7	0	12	11	13	10	16	18	6	9
2	4	29	4	4	0	7	12	0	19	0	0	0	4	0	3	3	8	14	11	0
1	7	5	0	4	0	4	12	0	0	0	0	0	8	4	3	0	0	14	22	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table IX

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR IX: LOOKS

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	19	15	20	12	15	6	8	7	6	25	22	21	13	23	25	14	23	12	7	22
4	6	2	3	6	10	10	5	6	12	4	4	0	11	2	1	6	1	7	2	1
3	1	1	2	2	2	4	1	2	5	1	1	0	1	0	1	7	0	3	1	0
2	1	0	0	1	1	5	1	4	0	0	0	2	0	1	0	2	0	0	1	0
1	1	3	3	2	0	3	0	0	4	0	0	0	0	2	3	1	1	0	7	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	68	71	71	52	54	21	47	37	22	83	81	91	52	82	83	47	92	55	39	96
4	21	10	11	26	36	36	29	32	44	13	15	0	44	7	3	20	4	32	11	4
3	4	5	7	9	7	14	6	11	19	3	4	0	4	0	3	23	0	14	6	0
2	4	0	0	4	4	28	6	21	0	0	0	9	0	4	0	7	0	0	6	0
1	4	14	11	9	0	11	0	0	15	0	0	0	0	7	10	3	4	0	39	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table X

Frequency and Percent Distribution by Teaching Variables

BEHAVIOR X: FUN IN LEARNING

Frequency

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	7	3	5	0	2	1	3	4	17	7	8	15	5	10	11	3	5	8	1	7
4	16	3	10	5	16	10	7	11	3	16	11	6	11	8	14	13	13	8	2	11
3	4	5	9	6	7	5	1	2	0	4	7	1	4	4	2	6	3	4	4	4
2	1	5	4	9	3	6	4	2	3	3	1	1	5	5	3	8	3	2	8	1
1	0	4	0	3	0	6	2	0	4	0	0	0	0	1	0	0	1	0	3	0

Percent

Class

RATING	RA1	RB1	RC1	RD1	TA1	TA2	TB1	TB2	SA1	SA2	SB1	SC1	CA1	CA2	CB1	CB2	IA1	IB1	IB2	IB3
5	25	14	18	0	7	4	18	21	63	23	30	65	20	36	37	10	20	36	6	30
4	57	14	36	22	57	36	41	58	11	53	41	26	44	29	47	43	52	36	11	48
3	14	24	32	26	25	28	6	11	0	13	26	4	16	14	7	20	12	18	22	17
2	4	24	14	39	11	21	24	11	11	10	4	4	20	18	10	27	12	9	44	4
1	0	19	0	13	0	21	12	0	15	0	0	0	0	4	0	0	4	0	17	0
N =	28	21	28	23	28	28	17	19	27	30	27	23	25	28	30	30	25	22	18	23

Table XI

Class and Sample Behavior Means: RA1

BEHAVIOR	CLASS	SAMPLE
I	3.93	3.98
II	3.89	4.05
III	4.32	4.01
IV	4.07	4.05
V	4.18	3.97
VI	4.25	4.25
VII	4.71	3.74
VIII	3.90	4.03
IX	4.46	4.28
X	4.04	3.53

Table XII

Class and Sample Behavior Means: RB1

BEHAVIOR	CLASS	SAMPLE
I	3.57	3.98
II	3.95	4.05
III	3.38	4.01
IV	3.86	4.05
V	3.76	3.97
VI	3.33	4.25
VII	2.67	3.74
VIII	3.52	4.03
IX	4.46	4.28
X	2.76	3.53

Table XIII

Class and Sample Behavior Means: RC1

BEHAVIOR	CLASS	SAMPLE
I	4.11	3.98
II	4.07	4.05
III	4.11	4.01
IV	3.57	4.05
V	4.18	3.97
VI	4.00	4.25
VII	3.75	3.74
VIII	4.00	4.03
IX	4.32	4.28
X	3.57	3.53

Table XIV

Class and Sample Behavior Means: RD1

BEHAVIOR	CLASS	SAMPLE
I	3.96	3.98
II	3.35	4.05
III	3.43	4.01
IV	3.10	3.97
V	3.13	3.97
VI	4.22	4.25
VII	2.83	3.74
VIII	3.52	4.03
IX	4.09	4.28
X	2.57	3.53

Table XV

Class and Sample Behavior Means: TA1

BEHAVIOR	CLASS	SAMPLE
I	4.21	3.98
II	4.25	4.05
III	4.53	4.01
IV	4.56	4.05
V	4.29	3.97
VI	4.36	4.25
VII	4.11	3.74
VIII	4.50	4.03
IX	4.39	4.28
X	3.61	3.53

Table XVI

Class and Sample Behavior Means: TA2

BEHAVIOR	CLASS	SAMPLE
I	3.64	3.98
II	3.79	4.05
III	3.64	4.01
IV	3.82	4.05
V	4.01	3.97
VI	3.86	4.25
VII	3.00	3.74
VIII	3.68	4.03
IX	3.39	4.28
X	2.79	3.53

Table XVII

Class and Sample Behavior Means: TB1

BEHAVIOR	CLASS	SAMPLE
I	4.12	3.98
II	4.00	4.05
III	3.82	4.01
IV	3.76	4.05
V	4.00	3.97
VI	4.24	4.25
VII	3.76	3.74
VIII	3.82	4.03
IX	3.94	4.28
X	3.29	3.53

Table XVIII

Class and Sample Behavior Means: TB2

BEHAVIOR	CLASS	SAMPLE
I	4.05	3.98
II	4.64	4.05
III	4.37	4.01
IV	4.11	4.05
V	4.32	3.97
VI	4.37	4.25
VII	3.95	3.74
VIII	4.47	4.03
IX	3.84	4.28
X	3.89	3.53

Table XIX

Class and Sample Behavior Means: SA1

BEHAVIOR	CLASS	SAMPLE
I	3.48	3.98
II	3.92	4.05
III	3.74	4.01
IV	3.89	4.05
V	3.30	3.40
VI	4.33	4.25
VII	3.03	3.74
VIII	3.59	4.03
IX	3.96	4.28
X	2.70	3.53

Table XX

Class and Sample Behavior Means: SA2

BEHAVIOR	CLASS	SAMPLE
I	4.17	3.98
II	4.33	4.05
III	4.17	4.01
IV	4.27	4.05
V	3.97	3.97
VI	4.67	4.25
VII	4.10	3.74
VIII	4.57	4.03
IX	4.80	4.28
X	3.90	3.53

Table XXI

Class and Sample Behavior Means: SB1

BEHAVIOR	CLASS	SAMPLE
I	4.33	3.98
II	4.07	4.05
III	4.56	4.01
IV	4.63	4.05
V	4.11	3.97
VI	4.44	4.25
VII	4.26	3.74
VIII	4.63	4.03
IX	4.78	4.28
X	3.96	3.53

Table XXII

Class and Sample Behavior Means: SC1

BEHAVIOR	CLASS	SAMPLE
I	4.35	3.98
II	4.48	4.05
III	4.39	4.01
IV	4.74	4.05
V	3.87	3.97
VI	4.78	4.25
VII	4.35	3.74
VIII	4.65	4.03
IX	4.74	4.28
X	4.52	3.53

Table XXIII

Class and Sample Behavior Means: CA1

BEHAVIOR	CLASS	SAMPLE
I	4.52	3.98
II	3.80	4.05
III	4.28	4.01
IV	3.84	4.05
V	3.64	3.97
VI	4.16	4.25
VII	3.24	3.74
VIII	3.88	4.03
IX	4.48	4.28
X	3.64	3.53

Table XXIV

Class and Sample Behavior Means: CA2

BEHAVIOR	CLASS	SAMPLE
I	3.61	3.98
II	4.32	4.05
III	4.07	4.01
IV	3.86	4.05
V	3.82	3.97
VI	4.50	4.25
VII	3.71	3.74
VIII	4.14	4.03
IX	4.54	4.28
X	3.75	3.53

Table XXV

Class and Sample Behavior Means: CB1

BEHAVIOR	CLASS	SAMPLE
I	4.20	3.98
II	4.43	4.05
III	4.27	4.01
IV	4.40	4.05
V	4.30	3.97
VI	4.27	4.25
VII	4.47	3.74
VIII	4.17	4.03
IX	4.50	4.28
X	4.10	3.53

Table XXVI

Class and Sample Behavior Means: CB2

BEHAVIOR	CLASS	SAMPLE
I	4.07	3.98
II	4.50	4.05
III	4.17	4.01
IV	4.23	4.05
V	4.03	3.97
VI	4.47	4.25
VII	4.47	3.74
VIII	4.23	4.03
IX	4.00	4.28
X	3.37	3.53

Table XXVII

Class and Sample Behavior Means: IB1

BEHAVIOR	CLASS	SAMPLE
I	4.08	3.98
II	3.80	4.05
III	3.88	4.01
IV	4.40	4.05
V	4.80	4.25
VI	4.80	4.25
VII	3.45	3.74
VIII	4.28	4.03
IX	4.80	4.28
X	3.72	3.53

Table XXVIII

Class and Sample Behavior Means: IB1

BEHAVIOR	CLASS	SAMPLE
I	3.82	3.98
II	3.82	4.05
III	3.63	4.01
IV	4.36	4.05
V	3.82	3.97
VI	4.18	4.25
VII	3.14	3.74
VIII	3.41	4.03
IX	4.41	4.28
X	4.00	3.53

Table XXIX

Class and Sample Behavior Means: IB2

BEHAVIOR	CLASS	SAMPLE
I	3.06	3.98
II	2.89	4.05
III	3.33	4.01
IV	3.06	4.05
V	3.50	3.97
VI	3.28	4.25
VII	2.94	3.94
VIII	3.33	4.03
IX	3.06	4.28
X	2.44	3.53

Table XXX

Class and Sample Behavior Means: IB3

BEHAVIOR	CLASS	SAMPLE
I	4.39	3.98
II	4.65	4.05
III	4.09	4.01
IV	4.57	4.05
V	4.70	3.97
VI	4.57	4.25
VII	3.78	3.74
VIII	4.30	4.03
IX	4.96	4.28
X	4.04	3.53

Table XXXI

Total Class and Sample Means

CLASS	TOTAL CLASS	TOTAL SAMPLE
RA1	4.18	3.99
RB1	3.53	3.99
RC1	3.97	3.99
RD1	3.47	3.99
TA1	4.28	3.99
TA2	3.57	3.99
TB1	3.88	3.99
TD2	4.20	3.99
SA1	3.69	3.99
SA2	4.29	3.99
SB1	4.37	3.99
SC1	4.49	3.99
CA1	3.95	3.99
CA2	4.03	3.99
CB1	4.31	3.99
CB2	4.15	3.99
IA1	4.18	3.99
IB1	3.86	3.99
IB2	3.09	3.99
IB3	4.40	3.99

APPENDIX E

BMD07M STEPWISE DISCRIMINANT ANALYSIS OUTPUT DATA

```
SUSPENDED                1
F-LEVEL FOR INCLUSION    3.8179
F-LEVEL FOR DELETION     3.8415
TOLERANCE LEVEL          0.0001
CONTROL VALUES           1111111111111111111111111

STEP NUMBER        0
VARIABLE ENTERED

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  497

  1   1.2965      5   1.0932      9   4.0352     13   2.9461     17   0.4048     21   0.1598
  2   2.7567      6   6.0254     10   4.1777     14   1.5839     18   0.9791     22   1.5251
  3   3.3567      7   3.3523     11   2.5879     15   2.9422     19   0.3921     23   1.0875
  4   0.2763      8   3.3171     12   5.9562     16   3.0581     20   1.2635     24   1.4173

STEP NUMBER        1
VARIABLE ENTERED   5

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  497

  5   10.9331

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  496

  1   1.2272      6   2.6533     10   1.1662     14   0.7123     18   0.9772     22   1.5398
  2   3.9535      7   3.7794     11   3.3257     15   1.4844     19   0.9261     23   1.6976
  3   0.2542      8   3.2568     12   1.8032     16   0.4938     20   1.3351     24   2.0105
  4   3.3548      9   2.2483     13   0.3745     17   3.4811     21   0.2364

U-STATISTIC          0.95797     DEGREES OF FREEDOM    1    2  497
APPROXIMATE F        1.92318     DEGREES OF FREEDOM    2  497.00

F MATRIX - DEGREES OF FREEDOM    1  497

             GROUP
                1           2
GROUP
     2    2.77373
     3   14.39314     0.57702

            FUNCTION
               1             2             3
VARIABLE
  5        3.11306       4.09313       4.20499

CONSTANT
        -4.03584      -6.91327      -7.50637

          NUMBER OF CASES CLASSIFIED INTO GROUP -
               1      2      3
GROUP
     1        12     14      2
     2        64    199    184
     3         2     11     12
```

STEP NUMBER 2
VARIABLE ENTERED 17

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 496

5	7.2587	17	3.4613

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 495

1	1.4347	6	2.6512	10	0.9989	14	2.9344	19	.9066	23	1.0356
2	0.0839	7	1.4855	11	2.2913	15	0.1694	20	1.1449	24	1.8344
3	0.4917	8	0.2733	12	1.0521	16	4.6353	21	0.2826		
4	0.2559	9	0.2723	13	3.7345	18	0.9977	22	0.4121		

U-STATISTIC .994471 DEGREES OF FREEDOM 2 2 497
APPROXIMATE F 7.15434 DEGREES OF FREEDOM 4 992.00

W MATRIX - DEGREES OF FREEDOM 2 496

GROUP	1	2
2	12.43905	
3	7.18541	1.54879

	FUNCTION 1	2	3
VARIABLE			
5	2.43511	3.33046	3.63641
17	1.33547	2.29732	1.09367
CONSTANT	-5.51146	-9.16587	-9.05122

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	17	9	2
2	125	266	116
3	6	9	10

STEP NUMBER 3
VARIABLE ENTERED 16

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 495

5	7.5382	16	4.6353	17	7.6659

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 494

1	0.9389	4	0.2729	8	0.1690	11	0.3726	14	1.2535	19	0.3494	22	0.4513
2	0.3334	6	2.2156	9	0.7081	12	1.3213	15	0.9272	20	1.7272	23	1.1891
3	0.4625	7	0.7252	10	0.7454	13	0.1183	18	0.5169	21	0.2849	24	1.2674

U-STATISTIC .992734 DEGREES OF FREEDOM 3 2 497
APPROXIMATE F 6.34217 DEGREES OF FREEDOM 6 990.00

F MATRIX - DEGREES OF FREEDOM 3 495

GROUP	1	2
2	8.5079	
3	5.42591	4.12215

VARIABLE	FUNCTION 1	2	3
5	1.65573	2.75955	2.876[illegible]
15	1.13649	1.05944	1.6411.9
17	-0.97772	-0.24498	-1.49247
CONSTANT	-7.55354	-10.81911	-11.94561

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	14	8	6
2	57	251	99
3	4	9	12

STEP NUMBER 4
VARIABLE ENTERED 6

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 494

5	6.3462	6	2.2156	15	4.1619	17	7.6626

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 493

1	0.8559	4	0.2117	9	1.2263	12	1.3164	16	0.[illegible]	20	2.5135	23	0.9955
2	0.2633	7	0.4987	10	0.1691	13	0.1354	18	0.4034	21	0.3193	24	1.4532
3	0.6519	8	0.1056	11	0.3862	14	0.6248	19	0.4234	22	0.4471		

U-STATISTIC 0.91910 DEGREES OF FREEDOM 4 2 497
APPROXIMATE F 5.32094 DEGREES OF FREEDOM 8 988.00

F MATRIX - DEGREES OF FREEDOM 4 494

GROUP	1	2
2	7.21005	
3	5.17034	3.40559

VARIABLE	FUNCTION 1	2	3
5	1.45546	2.30792	2.38158
6	3.57565	4.07963	4.45627
15	0.919[illegible]	0.75458	1.[illegible]7734
17	-1.03353	-0.31561	-1.55979

CONSTANT

-10.32329	-1.41774	-16.25975

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	16	6	0
2	96	223	123
3	3	9	13

STEP NUMBER 5
VARIABLE ENTERED 20

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 493

5	0.3342	6	2.871	16	4.5646	17	7.9689	20	2.3185

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 492

1	1.8826	4	3.3326	9	1.0159	12	1.2793	15	0.3281	21	0.3372	24	1.7296
2	0.2961	7	0.4727	10	0.1106	13	0.1613	18	0.0155	22	0.1185		
3	0.5116	8	0.8107	11	0.3767	14	0.9493	19	0.7334	23	0.9592		

U-STATISTIC .91153 DEGREES OF FREEDOM 5 2 497
APPROXIMATE F 4.73109 DEGREES OF FREEDOM 10 986.00

F MATRIX - DEGREES OF FREEDOM 5 493

GROUP	1	2
2	5.7[illegible]	
3	0.83353	3.0782

VARIABLE	FUNCTION 1	2	3
5	1.47682	2.34414	2.41225
8	2.74354	3.28053	3.77925
16	0.75382	0.59355	0.94518
17	-0.73756	-0.32241	-1.31576
20	6.26353	5.71266	5.08546

CONSTANT

-14.66727	-18.55383	-19.23117

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	17	7	4
2	105	232	110
3	4	10	11

STEP NUMBER 6
VARIABLE ENTERED 1

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 492

```
  1   1.8826        5   0.3192        6   2.6385        16   4.1487        17   7.8367        2   3.3431

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  491

  2   0.1945        7   0.4048        10   0.3767       13   0.1427        18   0.1371        22   0.0859
  3   0.5255        8   0.1973        11   0.3259       14   0.8481        19   0.8224        23   0.4577
  4   0.2455        9   1.5395        12   1.2532       15   0.9014        21   0.4335        24   1.2677

U-STATISTIC          0.93362     DEGREES OF FREEDOM    6    2  497
APPROXIMATE F        4.26240     DEGREES OF FREEDOM   12  984.00

F MATRIX - DEGREES OF FREEDOM     6  492

            GROUP
              1           2
GROUP
     2     4.34357
     3     4.13073     3.68385

           FUNCTION
              1             2             3
VARIABLE
  1        3.14377       3.26511       2.95723
  5        1.77492       2.55751       2.06550
  6        3.13331       3.56552       4.04823
 16        3.92443       3.75742       1.38917
 17       -3.97753      -0.26615      -1.54233
 20        9.84289       9.75683       3.44257

CONSTANT
         -25.25105     -27.55786     -26.01226

           NUMBER OF CASES CLASSIFIED INTO GROUP -
              1       2       3
GROUP
      1      16       7       5
      2     152     252      93
      3       4       8      13

****************************************************************************************************

STEP NUMBER          7
VARIABLE ENTERED     9

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  491

  1   2.4362        5   0.2757        6   3.3103        9   1.5395        16   5.4196        17   6.9300        20   3.2499

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  490

  2   0.2224        7   0.0083        11   0.3472       14   0.8400        19   0.7292        23   0.7395
  3   0.5830        8   0.1422        12   1.1432       15   0.1016        21   0.4311        24   1.4791
  4   0.2561        10   0.0596       13   0.1328       18   0.2747        22   0.1082

U-STATISTIC          0.85755     DEGREES OF FREEDOM    7    2  497
APPROXIMATE F        5.87711     DEGREES OF FREEDOM   14  982.00

F MATRIX - DEGREES OF FREEDOM     7  491
```

GROUP

GROUP	1	2
2	4.1[illegible]1	
3	3.75323	3.6[illegible]133

FUNCTION

VARIABLE	1	2	3
1	3.2[illegible]	3.30258	2.99525
5	[illegible]	-.52494	2.5[illegible]22
6	2.5517[illegible]	3.32173	3.79321
9	1.2[illegible]	1.37[illegible]3	.64073
15	[illegible].77514	.00652	[illegible]1835
17	-1.07[illegible]	-.37005	-1.59415
23	9.61759	9.72097	8.42951
CONSTANT	-25.44335	-27.79074	-26.56479

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	16	7	5
2	104	246	97
3	4	8	13

****

STEP NUMBER 8
VARIABLE ENTERED 24

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 490

1	1.7556	6	3.2773	16	5.1540	23	3.3364
5	5.4536	9	1.7506	17	6.0397	24	1.4791

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 489

2	0.2254	7	0.7224	11	0.4131	14	0.7616	19	0.7821	23	0.5778
3	0.7053	8	0.1066	12	0.9322	15	0.0824	21	0.2809		
4	0.2385	10	0.3303	13	0.1233	18	0.0901	22	0.0232		

U-STATISTIC .59200 DEGREES OF FREEDOM 8 2 497
APPROXIMATE F 5.58559 DEGREES OF FREEDOM 16 980.00

F MATRIX - DEGREES OF FREEDOM 8 490

GROUP

GROUP	1	2
2	3.53[illegible]9[illegible]	
3	3.52759	3.23957

FUNCTION

VARIABLE	1	2	3
1	2.73[illegible]3	2.81[illegible]9[illegible]	2.48876
5	1.7[illegible]	2.05091	2.71435
6	2.44159	2.89525	3.67425

8	1.83271	2.05293	1.28956
15	3.63314	0.09102	1.19832
17	-1.63426	-2.17 7	-2.19051
20	11.61793	11.03992	9.28033
24	0.32716	0.37501	0.35347

CONSTANT

-25.82716	-30.94217	-29.44749

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	8	4
2	37	252	98
3	4	9	12

STEP NUMBER 9
VARIABLE ENTERED 12

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 489

1	1.7591	5	3.3025	12	0.9322	17	4.1640	24	1.2672
5	6.0390	9	1.5937	16	4.8272	20	3.3176		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 488

2	0.1277	7	0.7959	11	0.5458	15	0.5 3	21	0.3148
3	0.6359	8	0.2532	13	0.0447	18	0.9 1	22	0.0 5
4	0.2346	10	0.0472	14	0.5666	19	0.8062	23	0.5739

U-STATISTIC 0.88921 DEGREES OF FREEDOM 9 2 497
APPROXIMATE F 0.28561 DEGREES OF FREEDOM 18 978.00

F MATRIX - DEGREES OF FREEDOM 9 489

GROUP	1	2
2	3.73221	
3	2.98847	2.87505

FUNCTION	1	2	3
VARIABLE			
1	2.73424	2.81 05	2.48756
5	1.83726	2.67563	2.74041
9	2.35869	2.37428	3.04465
8	1.93442	2.11200	1.30616
12	-1.26505	-2.76523	-1.67904
15	1.12344	0.82021	1.26823
17	-1.27114	-0.84245	-1.95011
20	11.67316	11.67.3	9.32925
24	0.33377	0.37904	0.35873

CONSTANT

-25.95105	-30.97408	-29.511 2

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	8	4
2	96	254	67
3	2	9	14

STEP NUMBER 10
VARIABLE ENTERED 3

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 488

1	1.9157	5	0.8504	9	1.0160	16	4.7926	20	2.9918		
3	1.8359	6	3.5232	12	1.5020	17	4.1467	24	1.4449		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 487

2	1.1231	7	1.7477	10	1.6432	13	0.0449	15	0.5356	19	1.2165	22	0.0225
4	1.2522	8	0.2479	11	0.4912	14	0.7110	18	0.2046	21	0.3587	23	0.7530

U-STATISTIC 0.5c917 DEGREES OF FREEDOM 1 2 487
APPROXIMATE F 3.03557 DEGREES OF FREEDOM 2 976.00

F MATRIX - DEGREES OF FREEDOM 10 488

GROUP	1	2
2	3.5[illegible]232	
3	2.6[illegible]948	2.56257

FUNCTION	1	2	3
VARIABLE			
1	-0.47[illegible]	-[illegible]	-0.[illegible]96
3	18.77914	13.[illegible]	19.19452
5	1.93333	2.[illegible]	2.37139
6	4.[illegible]	3.36922	6.15476
9	-0.[illegible]	-0.[illegible]	-1.26743
12	0.99[illegible]	1.[illegible]	1.53231
15	1.43824	1.14155	1.66548
17	0.07573	0.[illegible]	-0.56323
20	17.49[illegible]	17.[illegible]	19.[illegible]
24	0.[illegible]	0.[illegible]	-0.06138

CONSTANT
-140.[illegible] -149.23544 -149.21521

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	9	4
2	111	241	67
3	3	9	13

STEP NUMBER 11
VARIABLE ENTERED 19

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 487

1	2.0565	5	6.3258	9	1.5981	15	4.8978	19	1.2165	24	1.4173
3	1.2461	6	2.8234	12	0.9350	17	4.0240	20	3.4481		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 486

2	0.1249	7	3.3607	10	0.0417	13	0.0124	15	0.5521	21	0.0641	23	0.4251
4	0.2129	8	0.2034	11	0.4884	14	0.5594	18	0.0771	22	0.3050		

U-STATISTIC 0.85176 DEGREES OF FREEDOM 11 2 497
APPROXIMATE F 2.87492 DEGREES OF FREEDOM 22 974.0

F MATRIX - DEGREES OF FREEDOM 11 487

GROUP	1	2
2	3.21157	
3	2.70411	2.56177

VARIABLE	FUNCTION 1	2	3
1	-1.70553	-1.30652	-1.16292
3	21.16655	21.51459	21.73921
5	3.40535	4.27329	4.41269
6	3.15267	3.63984	4.34 81
9	-0.59505	-0.45517	-1.22155
12	-0.42919	0.09324	0.33877
15	1.65771	1.37414	1.84944
17	0.43343	0.89751	-0.18419
19	15.45742	15.74776	16.47595
20	15.13495	15.26370	13.85026
24	0.41553	0.46210	0.43225

CONSTANT

-159.79555	-169.12439	-171.05619

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	16	9	3
2	111	233	103
3	3	9	13

* *

STEP NUMBER 12
VARIABLE ENTERED 7

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 486

1	2.3473	5	6.5175	7	3.6667	12	1.0722	17	4.0913	20	3.5131
3	1.2271	6	2.1291	9	1.6919	15	4.6985	19	1.3348	24	1.6031

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 485

2	0.2566	8	0.1924	11	0.5345	14	0.5508	18	0.0765	22	[illegible]
4	0.2134	10	0.2219	13	0.0153	16	0.5605	21	0.6293	23	0.4317

```
WILKS'S LAMBDA-STATISTIC          0.87653      DEGREES OF FREEDOM   12    2  497
APPROXIMATE F                  2.57067         DEGREES OF FREEDOM   24  972.00

F MATRIX - DEGREES OF FREEDOM   12  486

                GROUP
                  1            2
GROUP
     2       2.99319
     3       2.93259          2.44428

              FUNCTION
                  1              2              3
VARIABLE
  1         -0.79147       -0.88174       -1.15760
  3         21.88545       21.09515       22.21637
  5          2.73531        3.64193        3.73547
  9          0.34493        0.97615        1.48821
  7          0.88327        0.53999        7.00356
  9         -0.03512       -1.07013       -1.06941
 12         -1.06645        0.13461       -0.20594
 15          1.05063        1.26033        0.73013
 17          0.43702        0.09962       -0.10247
 19         16.43699       15.63756       17.47171
 21         14.94521       15.12641       13.55613
 24          0.34791        0.39751        0.36358

CONSTANT
       -165.55115     -174.31665     -177.65240

          NUMBER OF CASES CLASSIFIED INTO GROUP -
              1      2      3
GROUP
     1       16      9      3
     2      113    230    104
     3        3      9     13

**********************************************************************

STEP NUMBER       13
VARIABLE ENTERED  21

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  485

  1   2.1835        5   6.3654        7   0.8229       12   1.1432       17   4.1281       20   4.0162       24   1.6223
  3   1.2252        6   2.1176        9   1.5714       16   4.8411       19   1.0573       21   0.0237

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  484

  2   0.2750        8   0.1739       11   0.5773       14   0.5429       18   0.0181       23   2.1257
  4   0.2723       10   0.2451       13  -0.3329       15   0.6509       22   0.3294

WILKS'S LAMBDA-STATISTIC          0.87639      DEGREES OF FREEDOM   13    2  497
APPROXIMATE F                  2.54434         DEGREES OF FREEDOM   26  970.00

F MATRIX - DEGREES OF FREEDOM   13  485

                GROUP
                  1            2
GROUP
```

2	2.77631	
3	2.34537	2.33643

VARIABLE	FUNCTION 1	2	3
1	-0.72755	-0.75155	-1.13247
3	21.63727	21.95236	22.21776
5	2.69511	3.55751	3.74196
6	0.35265	0.77.24	1.49705
7	6.91547	6.57256	7.02476
9	-0.93514	-0.843	-1.01073
12	-0.57235	0.29635	-0.13583
16	1.53624	1.24379	1.72374
17	0.43123	0.95294	-0.14965
19	16.13.25	16.17543	17.16431
20	15.55146	15.75500	14.5989
21	-0.51521	-0.62625	-0.39411
24	0.34615	0.39574	0.36196

CONSTANT

-165.66539	-174.48767	-177.11902

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	16	2
2	110	234	103
3	4	3	13

****

STEP NUMBER 14
VARIABLE ENTERED 23

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 484

1	1.6555	5	5.2931	7	0.7993	12	1.1379	17	4.0149	20	4.8951	23	2.1057
3	1.5135	6	2.0272	9	2.0019	16	5.4403	19	1.6436	21	2.2964	24	0.9516

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 483

2	0.2600	8	0.2793	11	0.5573	14	0.5268	18	0.4332
4	0.2552	10	0.3777	13	0.0130	15	0.8287	22	0.6749

U-STATISTIC 0.80083 DEGREES OF FREEDOM 14 2 497
APPROXIMATE F 2.01875 DEGREES OF FREEDOM 28 968.00

F MATRIX - DEGREES OF FREEDOM 14 484

GROUP	1	2
2	2.57269	
3	2.34938	2.43526

VARIABLE	FUNCTION 1	2	3
1	-0.74436	-0.77843	-1.12691

3	21.57[illegible]	21.89332	22.237[illegible]9
5	2.712[illegible]	3.6[illegible]357	3.09073
6	0.35[illegible]43	1.[illegible]1[illegible]16	1.49149
7	5.91537	6.57620	7.02215
9	-1.5[illegible]545	-1.70193	-1.63813
12	-1.57415	[illegible].295[illegible]7	-0.13541
15	1.5238[illegible]	1.23131	1.7246[illegible]
17	0.4725[illegible]	0.94416	-0.14579
19	15.[illegible]555[illegible]	16.17851	17.18409
20	15.7115[illegible]	15.92044	14.[illegible]749
21	-0.33354	-0.94991	-0.26928
23	[illegible].3665[illegible]	0.30793	-0.11992
24	0.31955	0.30901	[illegible].37067

CONSTANT

-165.72253	-174.54285	-177.12476

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	9	4
2	11[illegible]	242	95
3	4	9	12

* *

STEP NUMBER 15
VARIABLE ENTERED 15

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 483

1	2.0552	6	2.0255	12	1.7627	17	4.3076	21	2.5405
3	1.5153	7	0.3750	15	0.8267	19	1.7120	23	2.3318
5	6.4235	9	1.9480	16	4.0024	20	5.1732	24	0.8250

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 482

2	0.3331	8	0.4536	11	0.6271	14	0.9718	22	0.6853
4	0.2401	10	0.3811	13	0.0005	18	1.5685		

U-STATISTIC 0.06536 DEGREES OF FREEDOM 15 2 497
APPROXIMATE F 2.40454 DEGREES OF FREEDOM 30 966.00

F MATRIX - DEGREES OF FREEDOM 15 483

GROUP	1	2
2	2.45270	
3	2.18554	2.38282

FUNCTION

VARIABLE	1	2	3
1	-0.62901	-0.84561	-1.01442
3	21.54935	21.91689	22.25745
5	2.31727	3.72388	3.79939
6	0.40754	1.412[illegible]	1.51797
7	5.83525	6.55985	7.00642
9	-0.95831	-0.02234	-1.60967

12	1.24432	2.37293	1.03779
15	4.47356	5.11347	4.35767
16	-0.35884	-0.57743	.16138
17	0.71421	1.22.4.	1.38993
19	15.38072	15.98347	17.01816
20	10.09421	10.36352	14.38071
21	-1.05430	-1.20 37	-1.05.371
23	0.55530	0.58407	0.16495
24	0.27450	0.34051	0.34634

CONSTANT

-166.53121	-173.63144	-177.89503

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	9	4
2	113	246	91
3	4	8	13

****

STEP NUMBER 16
VARIABLE ENTERED 14

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 482

1	1.8244	6	1.9.74	12	1.7970	16	3.2729	20	5.2179	24	0.8821
3	1.6530	7	0.7312	14	0.9718	17	4.3489	21	2.5719		
5	6.3115	9	1.8425	15	1.2735	19	1.4346	23	2.5237		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 481

2	0.3371	8	0.4920	11	0.0257	18	0.4436
4	0.2812	10	0.3920	13	1.0634	22	0.7473

U-STATISTIC 0.83238 DEGREES OF FREEDOM 16 2 497
APPROXIMATE F 2.31463 DEGREES OF FREEDOM 32 964.00

F MATRIX - DEGREES OF FREEDOM 16 482

GROUP	1	2
2	2.31577	
3	2.15701	2.34568

FUNCTION

VARIABLE	1	2	3
1	-0.55577	-0.57191	-0.92108
3	21.05844	22.32479	22.39140
5	2.73499	3.66748	3.72892
6	0.31303	0.59913	1.33 44
7	0.85242	6.5.931	5.94328
9	-0.67050	-0.73438	-1.37940
12	-0.84765	0.11639	-1.18177
14	-3.25734	-3.51437	-4.391
15	2.03359	2.5.22	1.09079
16	1.94715	1.57318	2.87593

17	1.07351	4.17053	0.03513
19	15.01333	15.67553	10.63353
20	16.24753	10.31343	14.31782
21	-1.73.23	-1.17439	-1.47017
23	0.46779	0.48956	-0.05377
24	0.33787	0.35482	0.36423

CONSTANT

-167.03119 -176.25342 -178.91333

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	15	9	4
2	109	244	54
3	4	6	15

STEP NUMBER 17
VARIABLE ENTERED 13

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 481

1	1.6019	6	1.3119	12	2.2766	15	2.1359	19	1.6258	23	2.5329
3	1.4472	7	0.8150	13	1.0635	16	3.1302	20	5.4329	24	0.8871
5	0.1625	9	1.6617	14	2.0341	17	4.4385	21	2.7174		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 480

2	0.4354	4	0.2958	8	0.4213	10	0.3966	11	0.6252	18	0.3955	22	0.7039

U-STATISTIC 0.65859 DEGREES OF FREEDOM 17 2 497
APPROXIMATE F 2.24122 DEGREES OF FREEDOM 34 962.00

F MATRIX - DEGREES OF FREEDOM 17 481

GROUP	1	2
2	2.17491	
3	2.13901	2.33193

VARIABLE	FUNCTION 1	2	3
1	-1.62265	-1.63335	-1.96256
3	21.83772	22.12847	22.43121
5	2.84109	3.73752	3.77671
9	1.38803	1.39309	1.43818
7	0.79579	0.45969	0.91942
9	-1.03193	-0.91357	-1.69649
12	2.73779	3.46157	1.17751
13	5.32153	4.92378	3.35933
14	1.58307	2.09342	-1.96849
15	5.51776	5.69816	3.27927
16	-2.11202	-2.17103	0.31759
17	0.74155	1.23944	0.7073
19	15.37841	15.46747	16.49153
20	15.22844	16.45785	14.43261

21	-1.11354	-1.25117	-.52276
23	1.47572	.49762	-[illegible].4013
24	.31772	.35456	.36414

CONSTANT

-157.6433[illegible]	-176.72663	-179.13342

NUMBER OF CASES CLASSIFIED INTC GROUP -

GROUP	1	2	3
1	13	9	4
2	112	254	81
3	5	8	12

****

STEP NUMBER 18
VARIABLE ENTERED 22

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 480

1	1.2187	6	1.6337	12	2.3714	15	2.1626	19	1.2998	22	3.7[illegible]39
3	0.9652	7	0.3501	13	1.0163	16	3.1222	20	5.9284	23	2.7928
5	6.0633	9	1.5425	14	2.0448	17	4.2987	21	2.1128	24	0.9755

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 479

2	0.33[illegible]	4	0.2245	8	0.4520	10	0.4073	11	0.6248	18	0.1611

U-STATISTIC 0.85608 DEGREES OF FREEDOM 18 2 497
APPROXIMATE F 2.15442 DEGREES OF FREEDOM 36 960.00

F MATRIX - DEGREES OF FREEDOM 18 480

GROUP	1	2
2	2.15927	
3	2.00331	2.2595[illegible]

FUNCTION

VARIABLE	1	2	3
1	-1.[illegible]2337	-1.[illegible]1859	-1.31247
3	22.07[illegible]9	22.90150	23.21848
5	2.56[illegible]	3.[illegible]7[illegible]	3.0[illegible]
6	.83973	1.44019	1.83451
7	0.42.[illegible]	[illegible]	6.577[illegible]5
9	-1.216[illegible]	-1.[illegible]5498	-1.83164
12	3.43303	[illegible].157[illegible]8	1.73115
13	[illegible]3545	4.34402	3.1[illegible]617
14	0.60869	0.14158	-1.07319
15	5.75339	5.91725	3.47793
16	-2.14155	-2.19[illegible]	[illegible]215
17	1.51[illegible]	1.[illegible]559	-[illegible].12495
19	[illegible]	10.45641	17.38820
20	15.775[illegible]	1[illegible].91714	17.54779
21	-[illegible]27252	-[illegible]43542	[illegible]21600
22	-5.[illegible]7[illegible]	-5.7233	-5.18949
23	[illegible].64[illegible]3	[illegible].56275	2.73[illegible]93

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 24        0.25323       1.05.199       0.31636

CONSTANT
      -171.13235     -179.97278     -181.80237

           NUMBER OF CASES CLASSIFIED INTO GROUP -
              1        2        3
GROUP
      1      14        5        5
      2     113      252       30
      3       4        5       14

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STEP NUMBER        19
VARIABLE ENTERED   11

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  479

  1   1.1276        6   1.5634       11   0.0248       14   2.0518       17   4.5794       21   2.1314       24   1.0401
  3   0.9344        7   0.9105       12   2.5242       15   2.2301       19   1.3120       22   0.7033
  5   0.0515        9   1.5610       13   1.0134       16   3.1490       20   5.8170       23   2.7626

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  478

  2   0.3332        4   0.2281        8   0.4543       10   0.3694       18   0.1615

U-STATISTIC           0.65335     DEGREES OF FREEDOM   19    2  497
APPROXIMATE F         2.07235     DEGREES OF FREEDOM   38  956.00

F MATRIX - DEGREES OF FREEDOM   19  479

            GROUP
              1            2
GROUP
     2      2.11213
     3      1.93722      2.15578

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STEP NUMBER        20
VARIABLE ENTERED    9

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  478

  1   1.2150        6   1.5594        9   1.5419       13   0.9159       16   3.1485       20   5.6974       23   2.9112
  3   0.5216        7   0.8825       11   0.6267       14   1.9760       17   4.7493       21   2.2252       24   0.9869
  5   0.2547        8   0.4542       12   2.5851       15   2.3112       19   1.2880       22   0.7325

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  477

  2   0.4126        4   0.2296       10   0.1130       18   0.1320

U-STATISTIC           0.65223     DEGREES OF FREEDOM   20    2  497
APPROXIMATE F         1.98920     DEGREES OF FREEDOM   40  956.00

F MATRIX - DEGREES OF FREEDOM   20  478

            GROUP
              1            2
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GROUP
    2     1.73413
    3     1.68392     2.10742

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STEP NUMBER       21
VARIABLE ENTERED   2

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  477

  1   1.1516        5   3.5796        8   0.5035       12   2.5910       15   2.4626       19   1.3147       22   0.7660
  2   0.4126        6   1.5476        9   1.5528       13   0.9365       16   3.2522       20   5.9496       23   2.8607
  3   0.9216        7   1.7501       11   4.5300       14   2.0373       17   4.3390       21   2.2938       24   0.9946

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  476

  4   0.2314       10   0.1233       18   0.1301

U-STATISTIC             0.85276     DEGREES OF FREEDOM   21    2  497
APPROXIMATE F           1.91178     DEGREES OF FREEDOM   42  954.00

F MATRIX - DEGREES OF FREEDOM   21  477

            GROUP
              1           2
GROUP
    2     1.85704
    3     1.75100     1.99176

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STEP NUMBER       22
VARIABLE ENTERED   4

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM    2  476

  1   1.0737        5   5.0546        9   1.5031       14   2.1097       19   1.2566       23   2.8370
  2   0.4140        6   1.5407       11   0.5380       15   2.4670       20   5.0938       24   0.9933
  3   0.9553        7   1.7559       12   2.5977       16   3.2855       21   2.2049
  4   0.2314        8   0.5075       13   0.9760       17   4.3060       22   0.0386

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM    2  475

 10   0.1291       18   0.1279

U-STATISTIC             0.84994     DEGREES OF FREEDOM   22    2  497
APPROXIMATE F           1.83240     DEGREES OF FREEDOM   44  952.00

F MATRIX - DEGREES OF FREEDOM   22  476

            GROUP
              1           2
GROUP
    2     1.78322
    3     1.72732     1.95376

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STEP NUMBER       23
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VARIABLE ENTERED 19

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 475

1	1.1365	5	5.05[illegible]9	9	1.1411	13	1.0112	17	4.2514	22	0.6277
2	0.4279	6	1.4441	10	0.1291	14	2.0392	19	1.2520	23	2.3453
3	0.9541	7	1.1739	11	0.5106	15	2.4618	20	5.0951	24	0.9871
4	0.2319	8	0.2594	12	2.6235	16	3.3215	21	2.35[illegible]2		

VARIABLES NOT INCLUDED AND F TO ENTER - DEGREES OF FREEDOM 2 474

18 0.1278

J-STATISTIC 0.84947 DEGREES OF FREEDOM 23 2 497
APPROXIMATE F 1.75520 DEGREES OF FREEDOM 46 950.00

F MATRIX - DEGREES OF FREEDOM 23 475

	GROUP 1	2
GROUP 2	1.72332	
3	1.95171	1.32813

* *

STEP NUMBER 24
VARIABLE ENTERED 18

VARIABLES INCLUDED AND F TO REMOVE - DEGREES OF FREEDOM 2 474

1	1.1449	5	5.6427	9	1.1075	13	0.9991	17	4.3394	21	2.2885
2	0.4245	6	1.44[illegible]	10	0.1292	14	2.0148	18	0.1278	22	0.40[illegible]3
3	0.9311	7	1.1591	11	0.5161	15	2.4671	19	1.3190	23	2.3798
4	0.2295	8	0.2597	12	2.5054	16	3.2640	20	5.0129	24	0.9582

J-STATISTIC 0.84912 DEGREES OF FREEDOM 24 2 497
APPROXIMATE F 1.68430 DEGREES OF FREEDOM 48 948.00

F MATRIX - DEGREES OF FREEDOM 24 474

	GROUP 1	2
GROUP 2	1.63558	
3	1.57556	1.75435

F LEVEL INSUFFICIENT FOR FURTHER COMPUTATION

VARIABLE	FUNCTION 1	2	3
1	2.21033	1.23279	0.91382
2	4.59245	4.5[illegible]	4.54665
3	23.31720	23.5[illegible]42	23.67019
4	2.57259	2.62451	0.58579
5	3.41392	4.3[illegible]	4.35053
6	0.34[illegible]	1.1[illegible]00	1.00117
7	5.15459	5.75254	6.36610
8	4.26574	4.47451	4.32276

9	-3.33302	-2.93377	-3.03911
10	3.13552	3.16769	3.1836
11	5.32282	8.76441	6.72715
12	-1.17553	1.03446	-1.80587
13	1.97947	1.07347	1.7917
14	-2.34772	-3.04725	-3.11105
15	5.73000	7.15333	4.51611
16	-1.66654	-1.76322	1.79973
17	-2.33557	2.47972	-1.13121
18	-2.72552	-2.77074	-2.72747
19	14.16617	14.13337	15.11448
20	16.55383	16.02557	14.31513
21	-3.27301	-3.47140	1.21374
22	-3.30353	-3.04052	3.37298
23	5.49349	4.53216	6.50.25
24	0.53703	3.01253	3.62174

CONSTANT

-194.17432	-233.20589	-274.07935

GROUP WITH LARGEST PROB.	SQUARE OF DISTANCE FROM AND POSTERIOR PROBABILITY FOR GROUP -		
GROUP	1	2	3
1			
CASE			
1	1 2d.725 3.975,	3.543 0.229,	33.236 0.0 5,
2	1 14.337 0.953,	17.538 0.175,	17.2 5 0.193,
3	1 33.632 1.857,	35.653 0.071,	35.646 0.372,
4	3 21. 17 0.193,	21.768 0.107,	16.731 0.835,
5	3 27.516 0.371,	31.629 0.048,	20.024 0.581,
6	3 27.931 0.102,	19.491 0.303,	14.236 0.435,
7	1 16.716 0.75 ,	22.945 0.138,	22.136 0.112,
8	2 12.532 0.352,	11.834 0.528,	14.985 0.11 ,
9	1 22.149 0.334,	22.514 0.154,	22.919 0.202,
10	1 9.335 0.541,	13.9 4 0.247,	11.2 8 0.212,
11	1 21.547 0.771,	24.029 0.165,	20.523 0.064,
12	1 8.342 0.783,	12.225 0.136,	10.197 0.080,
13	1 0.361 0.510,	0.858 0.4 3,	1.0 .59 0.981,
14	2 11.3 3 0.372,	11.184 0.555,	15.257 0.072,
15	2 14.10 . 0.239,	14.459 0.263,	13.4 9 0.498,
16	1 13.337 0.479,	14.13 . 0.334,	15.227 0.191,
17	1 25.398 0.792,	30.364 0.1 9,	31.563 0.029,
18	1 35.95 0.8 2,	37.75 0.123,	33.55 0.078,
19	1 10.342 0.652,	19.659 0.3 6,	23.892 0.041,
20	2 13.73 0.2 2,	12.34 0.527,	14.173 0.211,
21	2 20.134 0.215,	25.955 0.055,	27.197 0.13 ,
22	2 10.993 0.258,	14.449 0.571,	10.908 0.171,
23	2 27.368 0.342,	20.079 0.482,	23.691 0.176,
24	2 34.312 0.4 4,	33.743 0.551,	39.248 0.035,
25	1 45.378 0.73 ,	48.375 0.181,	49.778 0.089,
26	1 25.965 0.528,	29.209 0.101,	26.669 0.371,
27	1 29.690 0.692,	31.344 0.333,	33.714 0.365,
28	1 22.637 0.83 ,	26.0 5 0.147,	29.782 0.023,
GROUP	1	2	3
2			
CASE			
1	2 31.422 0.5 ,	31.552 0.409,	30.985 0.031,
2	2 23.64 . 0.419,	23.252 0.5 6,	27.137 0.073,

3	3	33.572	0.110,	88.838	0.017,	80.841	0.473,					
4	2	13.333	0.173,	11.263	0.699,	15.[illegible]	0.18,					
5	1	23.315	0.695,	25.139	0.279,	24.916	0.128,					
6	1	33.349	0.526,	34.849	0.248,	35.141	0.226,					
7	2	20.535	0.153,	24.384	0.565,	23.775	0.282,					
8	2	54.171	0.142,	47.844	0.946,	56.664	0.112,					
9	1	32.377	0.557,	32.941	0.42 ,	33.839	0.122,					
10	1	23.385	0.039,	28.199	0.266,	31.729	0.175,					
11	1	28.334	0.937,	34.022	0.054,	37.631	0.119,					
12	3	135.243	0.181,	102.123	0.[illegible]4,	171.305	0.995,					
13	2	33.274	0.4 5,	38.096	0.444,	43.254	0.151,					
14	2	21.199	0.688,	16.815	0.757,	19.991	0.154,					
15	2	19.333	0.202,	17.278	0.642,	19.9 5	0.156,					
16	3	30.832	0.123,	24.990	0.432,	24.535	0.544,					
17	2	22.037	0.190,	18.569	0.559,	19.537	0.345,					
18	2	43.518	0.197,	41.339	0.585,	43.3[illegible]	0.219,					
19	2	43.235	0.152,	42.851	0.788,	47.708	0.268,					
20	2	26.876	0.166,	24.322	0.664,	27.381	0.145,					
21	1	20.732	0.3 1,	31.431	0.280,	35.123	0.114,					
22	2	23.996	0.365,	23.153	0.555,	27.[illegible]0	0.281,					
23	2	20.261	0.335,	25.4[illegible]1	0.515,	27.871	0.15[illegible],					
24	2	24.476	0.342,	18.776	0.718,	20.90[illegible]	0.241,					
25	2	33.183	0.136,	35.835	0.634,	38.465	0.177,					
26	2	19.335	0.325,	18.351	0.532,	20.973	0.143,					
27	2	9.918	0.259,	8.574	0.507,	13.125	0.234,					
28	4	17.368	0.783,	20.477	0.1[illegible],	22.798	0.[illegible]52,					
29	1	9.142	0.737,	11.981	0.172,	13.182	0.[illegible]93,					
30	2	37.736	0.261,	36.[illegible]31	0.628,	39.485	0.112,					
31	2	19.573	0.128,	16.346	0.643,	18.453	0.227,					
32	1	10.345	0.[illegible]3[illegible],	10.934	0.429,	13.177	0.141,					
33	1	11.6[illegible]2	0.453,	11.767	0.417,	14.[illegible]3	0.130,					
34	1	9.534	0.653,	12.721	0.133,	11.762	0.214,					
35	1	37.[illegible]4[illegible]	0.553,	38.796	0.236,	39.[illegible]26	0.211,					
36	1	21.957	0.[illegible]28,	28.246	0.[illegible]36,	25.562	0.137,					
37	2	2[illegible].516	0.244,	19.1[illegible]4	0.494,	20.365	0.263,					
38	3	19.437	0.239,	19.622	0.218,	17.790	0.544,					
39	1	14.722	0.750,	17.491	0.188,	19.712	0.[illegible]62,					
40	1	17.686	0.458,	18.678	0.253,	18.[illegible]8	0.289,					
41	2	49.[illegible]6	0.195,	45.8[illegible]6	0.799,	53.635	0.[illegible]16,					
42	2	5[illegible].137	0.169,	47.131	0.704,	52.772	0.[illegible] 47,					
43	3	29.[illegible]0[illegible]	0.[illegible]7,	29.841	0.097,	23.641	0.796,					
44	3	13.251	0.[illegible]18[illegible],	13.495	0.159,	16.642	0.662,					
45	3	36.519	0.379,	34.766	0.281,	32.2[illegible]9	0.725,					
46	3	16.921	0.171,	15.[illegible]99	0.316,	14.721	0.513,					
47	3	23.433	0.251,	23.512	0.241,	22.125	0.[illegible]57,					
48	3	14.[illegible]37	0.131,	15.[illegible]57	0.[illegible]74,	13.769	0.794,					
49	3	43.449	0.[illegible]37,	45.996	0.122,	43.432	0.441,					
50	3	3[illegible].859	0.129,	3[illegible].637	0.[illegible]32,	23.[illegible]	0.939,					
51	3	20.145	0.[illegible]14,	21.819	0.[illegible]73,	20.631	0.612,					
52	3	26.935	0.126,	23.943	0.124,	23.[illegible]94	0.848,					
53	3	17.534	0.[illegible]54,	16.214	0.[illegible]3[illegible],	12.[illegible]38	0.842,					
54	3	15.651	0.207,	15.[illegible]80	0.274,	13.813	0.519,					
55	2	29.885	0.205,	29.169	0.379,	23.297	0.[illegible]35,					
56	3	23.522	0.[illegible]47,	21.[illegible]92	0.145,	17.654	0.[illegible]8[illegible],					
57	3	15.737	0.[illegible]18,	14.919	0.189,	12.175	0.783,					
58	3	16.321	0.[illegible]37,	13.[illegible]81	0.153,	11.145	0.[illegible]61[illegible],					
59	3	26.534	0.173,	26.597	0.169,	23.862	0.[illegible]59,					
60	3	24.352	0.[illegible]6[illegible],	22.341	0.185,	19.543	0.740,					
61	3	22.7[illegible]8	0.[illegible]2[illegible],	20.[illegible]13	0.[illegible]95,	15.662	0.[illegible]88[illegible],					
62	1	26.34[illegible]	0.71[illegible],	28.887	0.199,	30.432	0.[illegible]92,					

32	3	21.973	0.[illegible],	16.383	0.191,	12.956	0.84[illegible],
34	3	14.[illegible]13	0.126,	12.[illegible]79	0.352,	11.[illegible]96	[illegible].542,
35	3	21.[illegible]91	0.225,	23.038	[illegible].63,	16.782	[illegible].713,
36	3	26.236	0.005,	24.656	0.142,	21.22[illegible]	0.793,
37	3	14.237	0.322,	14.217	0.326,	14.[illegible]57	0.352,
38	3	16.342	0.354,	19.439	0.[illegible]7,	17.935	[illegible].439,
39	3	19.734	0.[illegible]7,	21.567	[illegible]7,	18.879	[illegible].486,
70	3	23.167	0.[illegible]0,	21.776	[illegible]57,	18.870	0.665,
71	2	481.132	0.[illegible]1,	478.642	0.843,	481.637	[illegible].69,
72	1	22.346	0.402,	23.134	0.417,	25.963	[illegible]1,
73	2	22.521	0.135,	19.089	[illegible].557,	22.671	0.3[illegible]8,
74	1	30.238	0.431,	36.417	0.450,	30.249	0.163,
75	2	24.[illegible]10	0.[illegible]3,	25.[illegible]8	0.520,	25.394	[illegible].456,
76	2	2[illegible].[illegible]01	0.[illegible]32,	14.493	0.511,	14.724	0.457,
77	2	21.395	0.198,	19.898	0.419,	2[illegible].[illegible]83	0.382,
78	2	36.[illegible]91	0.[illegible]84,	34.003	[illegible].718,	37.251	0.199,
79	2	32.461	0.146,	27.[illegible]63	0.681,	28.893	0.273,
80	3	23.989	0.[illegible]08,	22.475	0.210,	23.[illegible]85	0.092,
81	3	33.114	0.[illegible]3,	26.123	0.275,	24.212	0.710,
82	2	20.613	0.[illegible]93,	21.593	[illegible].055,	23.216	[illegible].291,
83	3	34.[illegible]13	0.[illegible]3[illegible],	29.936	0.[illegible]69,	28.41[illegible]	0.662,
84	3	31.153	0.[illegible]28,	36.214	[illegible].333,	34.910	0.039,
85	3	27.458	0.[illegible]41,	22.732	0.435,	22.302	[illegible].524,
86	2	27.[illegible]18	0.[illegible]15,	20.593	0.573,	21.233	0.414,
87	2	22.735	0.165,	23.613	0.471,	21.125	0.364,
88	2	31.254	0.[illegible]10,	22.39[illegible]	0.704,	25.[illegible]59	0.226,
89	2	31.869	0.[illegible]16,	23.847	[illegible].876,	20.935	0.138,
90	2	2[illegible].135	0.[illegible]0[illegible],	15.451	0.037,	22.[illegible]74	0.083,
91	3	36.413	0.293,	39.771	0.[illegible]55,	34.[illegible]15	0.652,
92	2	24.[illegible]10	0.[illegible]33,	24.443	[illegible].366,	24.374	[illegible].291,
93	3	27.154	0.213,	27.354	0.193,	25.[illegible]3	0.594,
94	2	19.[illegible]56	0.[illegible]12,	15.[illegible]7[illegible]	[illegible].549,	17.638	0.339,
95	2	33.[illegible]15	0.[illegible]38,	33.[illegible]41	0.385,	34.[illegible]13	0.276,
96	2	29.[illegible]6[illegible]	0.341,	29.[illegible]2	[illegible].388,	29.319	0.271,
97	2	21.[illegible]70	0.182,	18.[illegible]57	[illegible].727,	22.[illegible]48	0.112,
98	2	2[illegible].[illegible]15	0.[illegible]03,	15.761	0.[illegible]33,	17.922	0.[illegible]4,
99	2	17.[illegible]89	0.[illegible]49,	17.[illegible]43	0.375,	17.[illegible]52	0.277,
100	2	24.354	0.[illegible]07,	19.46[illegible]	0.777,	22.674	0.150,
101	1	13.[illegible]29	0.413,	13.641	0.353,	14.458	0.235,
102	2	37.[illegible]13	0.[illegible]39,	33.941	0.[illegible]16,	36.990	[illegible].154,
103	2	26.[illegible]32	0.27[illegible],	25.127	0.643,	23.259	0.[illegible]82,
104	2	17.733	0.188,	15.422	0.596,	17.455	0.216,
105	2	26.[illegible]91	0.[illegible]59,	21.185	0.[illegible]83,	23.[illegible]7	0.262,
106	2	21.[illegible]2[illegible]	0.269,	19.[illegible]35	[illegible].601,	24.566	0.[illegible] 52,
107	2	25.[illegible]21	0.[illegible]23,	21.931	0.776,	25.994	0.[illegible]2,
108	2	15.[illegible]32	0.[illegible]70,	12.[illegible]62	0.587,	13.[illegible]6	0.315,
109	2	22.239	0.[illegible]78,	21.927	[illegible].463,	24.379	0.137,
110	2	28.[illegible]2[illegible]	0.[illegible]57,	22.759	0.837,	2[illegible].[illegible]92	[illegible].136,
111	2	26.[illegible]7[illegible]	0.[illegible]22,	18.715	0.894,	23.442	0.[illegible]84,
112	2	31.[illegible]38	0.[illegible]16,	24.665	0.533,	25.[illegible]0[illegible]	0.451,
113	3	2[illegible].[illegible]55	0.[illegible]35,	22.834	0.176,	19.833	0.709,
114	3	26.564	0.[illegible]04,	24.857	0.246,	22.916	0.650,
115	3	1[illegible].372	0.[illegible]4[illegible],	14.[illegible]2[illegible]	[illegible].431,	13.[illegible]7[illegible]	0.529,
116	3	17.563	0.[illegible]89,	17.263	[illegible].219,	15.276	0.592,
117	2	22.374	0.[illegible]35,	21.[illegible]71	0.641,	24.257	0.124,
118	3	1[illegible].287	0.[illegible]37,	19.3[illegible]6	0.185,	17.281	[illegible].[illegible]8,
119	3	17.221	0.[illegible]63,	14.[illegible]07	[illegible].258,	12.537	0.677,
120	3	24.131	0.[illegible]54,	23.458	0.223,	21.425	0.617,
121	2	21.[illegible]83	0.222,	19.393	[illegible].516,	23.748	0.[illegible]2,
122	3	22.446	0.[illegible]34,	15.329	0.439,	14.95[illegible]	[illegible].527,

123	2	41.14[illegible]	0.110	33.[illegible]9	0.918	38.263	[illegible]
124	2	[illegible]	0.312	23.129	0.634	24.332	0.384
125	3	1[illegible].445	0.[illegible]37	14.595	0.423	14.106	0.54[illegible]
126	2	35.95[illegible]	0.182	37.49[illegible]	0.024	39.83[illegible]	0.194
127	2	42.365	0.184	39.75[illegible]	0.753	44.7[illegible]7	0.[illegible]63
128	2	21.364	0.[illegible]44	16.413	0.6[illegible]4	17.5[illegible]1	0.352
129	3	20.273	0.[illegible]23	2[illegible].043	0.384	19.770	0.593
130	2	24.111	0.154	21.759	0.5[illegible]	22.497	0.346
131	2	23.4[illegible]	0.[illegible]54	18.753	0.571	19.593	0.375
132	2	26.[illegible]44	0.[illegible]38	22.966	0.621	24.[illegible]64	0.341
133	1	24.[illegible]74	0.526	27.121	0.14[illegible]	25.368	0.333
134	3	24.353	0.224	23.8[illegible]	0.381	23.734	0.395
135	2	25.377	0.[illegible]44	2[illegible].[illegible]61	0.632	21.396	0.324
136	2	21.575	[illegible]	18.301	0.502	19.362	0.344
137	2	29.236	0.211	27.236	0.581	29.254	0.2[illegible]8
138	2	[illegible].963	0.[illegible]76	28.319	0.474	28.424	0.45[illegible]
139	3	21.367	0.267	22.094	0.139	19.792	0.594
140	1	27.176	0.015	28.651	0.294	30.965	0.091
141	2	25.437	0.1[illegible]9	22.124	0.753	26.[illegible]7	0.1[illegible]8
142	2	20.[illegible]1	[illegible]	22.091	0.523	23.319	0.362
143	1	24.355	0.444	20.[illegible]89	0.239	25.523	0.317
144	2	34.3[illegible]2	0.191	32.536	0.593	3[illegible].557	0.216
145	2	25.[illegible]34	0.1[illegible]4	22.494	0.011	24.[illegible]21	0.285
146	2	53.394	0.[illegible]41	47.293	0.852	51.066	0.[illegible]97
147	1	16.533	0.381	16.567	0.375	17.428	0.244
148	1	21.360	0.472	22.5[illegible]4	0.267	22.550	0.20[illegible]
149	3	20.459	0.[illegible]94	23.742	0.365	22.959	0.541
150	2	35.728	0.103	33.697	0.449	33.989	0.388
151	2	22.173	0.109	20.[illegible]73	0.540	21.453	0.271
152	1	15.71[illegible]	0.565	17.762	0.334	20.145	0.1[illegible]1
153	2	14.1[illegible]6	0.424	13.836	0.485	17.181	0.[illegible]91
154	2	10.252	0.372	15.299	0.599	21.4[illegible]6	0.[illegible]28
155	2	17.534	0.189	14.824	0.734	19.348	0.[illegible]76
156	2	1[illegible].0[illegible]	0.313	9.5[illegible]9	0.596	13.257	0.[illegible]91
157	1	12.030	0.7[illegible]1	15.362	0.185	16.325	0.114
158	2	22.346	0.245	20.752	0.697	25.716	0.[illegible]53
159	2	1[illegible].963	0.355	1[illegible].193	0.527	13.176	0.119
160	2	16.373	0.311	14.994	0.620	19.395	0.[illegible]69
161	1	17.300	0.613	18.615	0.328	22.[illegible]54	0.059
162	2	[illegible]	0.313	9.5[illegible]9	0.596	13.257	0.[illegible]91
163	2	1[illegible].[illegible]48	0.3[illegible]1	9.501	0.6[illegible]3	13.231	0.[illegible]96
164	1	15.[illegible]57	0.[illegible]20	2[illegible].175	0.156	24.437	0.[illegible]18
165	3	22.[illegible]13	0.34[illegible]	23.116	0.227	21.826	0.43[illegible]
166	2	14.257	0.45[illegible]	14.156	0.408	17.65[illegible]	0.[illegible]81
167	1	24.378	0.451	25.439	0.266	25.311	0.283
168	2	11.527	0.38[illegible]	10.75[illegible]	0.513	13.067	0.1[illegible]7
169	2	10.373	0.167	13.796	0.780	13.428	0.[illegible]47
170	1	12.394	0.409	14.36[illegible]	0.225	13.749	0.3[illegible]6
171	1	13.[illegible]78	0.473	13.942	0.397	14.605	0.22[illegible]
172	1	15.1[illegible]	0.452	15.218	0.426	17.7[illegible]	0.123
173	1	19.[illegible]96	0.488	20.3[illegible]7	0.418	23.283	0.[illegible]94
174	2	8.177	0.382	7.814	0.458	9.922	0.160
175	1	6.304	0.494	7.193	0.4[illegible]6	1[illegible].[illegible]2	0.1[illegible]
176	1	14.[illegible]04	0.542	15.523	0.3[illegible]1	13.837	0.[illegible]57
177	2	14.694	0.170	11.817	0.716	15.489	0.114
178	1	11.839	0.8[illegible]4	15.083	0.161	19.827	0.[illegible]25
179	1	15.992	0.036	17.648	0.30[illegible]	23.066	0.015
180	2	13.7[illegible]	0.15[illegible]	11.[illegible]27	0.609	12.971	0.251
181	2	21.127	0.157	18.984	0.459	19.338	0.384
182	1	7.349	0.406	7.551	0.421	1[illegible].199	0.112

133	1	13.415	0.457,	13.448	0.449,	16.585	0.194,		
134	1	7.349	0.466,	7.551	0.421,	10.199	0.112,		
135	1	11.[illegible]3	0.524,	11.892	0.351,	13.868	0.125,		
136	2	6.252	0.357,	7.434	0.524,	10.435	0.120,		
137	2	7.827	0.422,	7.529	0.489,	10.942	0.089,		
138	2	7.327	0.422,	7.529	0.489,	10.942	0.089,		
139	1	11.573	0.456,	11.745	0.448,	15.028	0.064,		
140	2	7.[illegible]3	0.356,	7.396	0.452,	9.581	0.152,		
141	2	14.067	0.358,	9.469	0.769,	12.323	0.182,		
142	2	14.492	0.151,	10.984	0.759,	14.842	0.11[illegible],		
143	2	17.554	0.064,	12.612	0.752,	15.417	0.165,		
144	1	9.658	0.007,	10.932	0.321,	13.942	0.071,		
145	1	14.014	0.434,	15.[illegible]82	0.383,	17.291	0.132,		
146	2	18.211	0.174,	13.373	0.830,	17.694	0.096,		
147	1	13.156	0.871,	17.415	0.195,	20.417	0.023,		
148	2	12.345	0.165,	8.969	0.711,	10.380	0.223,		
149	2	9.331	0.439,	9.135	0.485,	12.042	0.070,		
200	2	13.318	0.031,	9.429	0.724,	12.055	0.195,		
201	1	6.351	0.516,	6.858	0.483,	10.059	0.081,		
202	2	8.528	0.252,	6.728	0.651,	10.524	0.098,		
203	2	11.321	0.236,	9.939	0.004,	12.592	0.160,		
204	2	33.4d2	0.213,	31.357	0.617,	33.935	0.17[illegible],		
205	1	9.555	0.523,	10.237	0.372,	12.746	0.196,		
206	2	9.071	0.232,	6.978	0.001,	10.619	0.107,		
207	1	6.[illegible]9	0.530,	7.501	0.394,	10.780	0.076,		
208	2	9.117	0.278,	7.621	0.588,	10.574	0.134,		
209	1	6.237	0.542,	6.638	0.411,	9.731	0.086,		
210	2	19.[illegible]2	0.066,	13.858	0.861,	18.776	0.074,		
211	2	13.377	0.378,	9.011	0.554,	13.814	0.068,		
212	1	19.372	0.492,	19.482	0.466,	24.208	0.142,		
213	1	6.445	0.489,	6.749	0.420,	9.795	0.092,		
214	2	8.653	0.242,	6.650	0.656,	10.375	0.102,		
215	2	6.622	0.209,	7.422	0.583,	10.452	0.128,		
216	1	13.[illegible]8	0.753,	12.083	0.198,	15.439	0.[illegible]5,		
217	1	6.445	0.489,	6.749	0.420,	9.795	0.092,		
218	1	27.272	0.594,	28.798	0.275,	30.232	0.134,		
219	2	24.748	0.[illegible]99,	20.594	0.791,	24.533	0.11[illegible],		
220	2	16.587	0.473,	16.535	0.484,	21.345	0.044,		
221	2	24.522	0.478,	24.433	0.580,	30.627	0.023,		
222	1	2[illegible].657	0.613,	21.955	0.317,	25.[illegible]6	0.068,		
223	2	26.933	0.312,	26.[illegible]77	0.491,	27.912	0.196,		
224	2	33.836	0.078,	28.972	0.891,	35.7[illegible]1	0.[illegible]31,		
225	2	34.313	0.[illegible]0,	33.848	0.505,	37.191	0.[illegible]95,		
226	2	37.[illegible]71	0.229,	35.276	0.659,	38.834	0.111,		
227	2	33.747	0.139,	30.287	0.783,	34.9[illegible]5	0.[illegible]73,		
228	2	30.[illegible]22	0.182,	28.169	0.614,	30.361	0.[illegible]25,		
229	2	35.498	0.456,	35.222	0.523,	41.641	0.[illegible]21,		
230	2	21.587	0.249,	19.734	0.628,	23.[illegible]01	0.123,		
231	2	34.521	0.428,	34.038	0.545,	40.[illegible]29	0.[illegible]27,		
232	2	29.499	0.311,	28.478	0.518,	33.[illegible]71	0.171,		
233	2	21.851	0.459,	21.839	0.402,	25.309	0.[illegible]79,		
234	2	17.[illegible]90	0.435,	10.763	0.513,	21.341	0.[illegible]52,		
235	2	16.587	0.473,	10.535	0.484,	21.345	0.044,		
236	2	32.582	0.279,	30.704	0.[illegible]93,	37.161	0.[illegible]28,		
237	2	29.185	0.239,	27.287	0.618,	33.215	0.143,		
238	2	37.[illegible]65	0.422,	36.813	0.473,	39.909	0.[illegible]99,		
239	1	17.535	0.496,	17.887	0.416,	21.[illegible]10	0.[illegible]87,		
240	1	22.534	0.635,	24.594	0.227,	29.[illegible]90	0.138,		
241	1	55.318	0.462,	55.346	0.450,	58.774	0.[illegible]82,		
242	2	18.923	0.472,	18.873	0.482,	23.581	0.[illegible]46,		

243	2	25.329	0.119,	22.756	0.735,	20.202	0.196,
244	2	27.575	0.342,	27.096	0.408,	28.513	0.239,
245	2	31.456	0.227,	28.861	0.757,	34.929	0.136,
246	1	25.166	0.268,	28.262	0.172,	32.533	0.029,
247	2	21.966	0.392,	21.241	0.509,	20.596	0.139,
248	2	17.857	0.275,	18.101	0.662,	21.831	0.162,
249	2	17.857	0.275,	16.101	0.662,	21.831	0.162,
250	2	23.279	0.288,	21.434	0.665,	26.772	0.046,
251	2	22.977	0.329,	21.669	0.627,	27.142	0.043,
252	2	18.593	0.374,	18.118	0.476,	21.415	0.151,
253	2	22.353	0.719,	24.684	0.895,	29.571	0.086,
254	2	24.310	0.134,	27.423	0.787,	24.943	0.302,
255	2	26.504	0.182,	24.699	0.564,	26.294	0.254,
256	2	30.133	0.137,	23.006	0.908,	29.197	0.056,
257	2	25.824	0.243,	24.123	0.562,	26.217	0.198,
258	2	24.612	0.374,	23.661	0.489,	25.389	0.206,
259	2	25.776	0.177,	21.147	0.778,	24.553	0.145,
260	2	19.550	0.347,	18.872	0.487,	21.425	0.166,
261	2	29.709	0.133,	23.154	0.863,	27.386	0.134,
262	2	29.215	0.116,	25.629	0.711,	28.483	0.171,
263	2	29.709	0.133,	23.154	0.863,	27.386	0.134,
264	2	30.381	0.125,	23.263	0.873,	27.568	0.101,
265	2	20.177	0.259,	19.165	0.578,	23.318	0.272,
266	3	21.575	0.219,	22.046	0.173,	19.532	0.068,
267	1	12.132	0.459,	12.157	0.445,	15.336	0.105,
268	1	14.432	0.763,	17.112	0.221,	20.496	0.137,
269	1	9.247	0.490,	9.446	0.420,	12.265	0.098,
270	2	10.435	0.153,	7.612	0.629,	9.728	0.218,
271	1	25.467	0.068,	22.434	0.251,	24.067	0.082,
272	3	23.336	0.345,	25.420	0.127,	22.549	0.541,
273	3	23.926	0.155,	23.090	0.175,	25.999	0.079,
274	2	23.510	0.130,	18.038	0.448,	18.103	0.421,
275	2	8.533	0.368,	8.076	0.488,	10.325	0.123,
276	2	13.567	0.395,	13.094	0.527,	16.918	0.178,
277	2	13.269	0.274,	11.558	0.643,	15.650	0.083,
278	2	10.023	0.358,	9.162	0.551,	12.754	0.191,
279	2	28.774	0.344,	28.785	0.537,	31.109	0.118,
280	2	27.926	0.305,	27.446	0.489,	30.153	0.126,
281	2	13.950	0.173,	10.303	0.771,	13.605	0.156,
282	2	22.447	0.112,	18.470	0.819,	23.439	0.168,
283	2	9.557	0.334,	8.503	0.565,	11.940	0.101,
284	2	14.160	0.181,	11.499	0.684,	14.741	0.135,
285	2	11.091	0.176,	8.642	0.698,	12.263	0.126,
286	3	42.059	0.077,	39.029	0.274,	37.581	0.656,
287	3	25.139	0.292,	25.122	0.295,	24.445	0.413,
288	2	24.713	0.362,	24.295	0.464,	26.163	0.174,
289	1	22.059	0.475,	22.967	0.448,	25.466	0.117,
290	1	22.383	0.507,	24.901	0.169,	24.004	0.304,
291	2	24.734	0.417,	26.249	0.519,	24.126	0.675,
292	2	21.709	0.374,	21.608	0.393,	22.658	0.233,
293	2	12.235	0.351,	11.825	0.431,	13.197	0.217,
294	1	24.307	0.541,	25.801	0.419,	25.198	0.149,
295	2	17.731	0.355,	17.381	0.423,	18.088	0.221,
296	3	22.321	0.266,	22.672	0.287,	21.785	0.447,
297	1	14.668	0.650,	17.087	0.190,	17.542	0.154,
298	1	27.203	0.499,	27.869	0.358,	29.705	0.143,
299	1	17.543	0.012,	19.635	0.191,	19.666	0.206,
300	2	22.079	0.373,	22.650	0.381,	23.517	0.246,
301	2	13.213	0.333,	12.398	0.501,	14.613	0.160,
302	2	17.517	0.136,	14.509	0.613,	16.259	0.254,

303	2	19.736	0.343,	19.105	0.474,	21.117	0.179,
304	2	12.37	0.334,	12.921	0.394,	14.065	0.222,
305	2	13.585	0.337,	13.144	0.482,	15.744	0.131,
306	2	16.781	0.258,	15.[illegible]95	0.600,	17.981	0.142,
307	1	13.771	0.464,	14.165	0.381,	15.971	0.155,
308	2	22.554	0.364,	21.931	0.497,	24.472	0.134,
309	2	23.345	0.288,	22.5[illegible]	0.591,	25.689	0.121,
310	2	22.637	0.783,	18.335	0.713,	23.853	0.204,
311	1	12.548	0.603,	12.969	0.373,	14.075	0.167,
312	2	16.328	0.239,	16.782	0.604,	23.631	0.097,
313	2	19.755	0.333,	19.049	0.479,	23.849	0.193,
314	2	15.516	0.149,	15.849	0.587,	11.8[illegible]	0.304,
315	2	17.[illegible]38	0.248,	15.742	0.474,	10.8[illegible]	0.278,
316	2	14.149	0.162,	11.[illegible]93	0.748,	15.341	0.089,
317	2	11.772	0.[illegible]93,	8.398	0.553,	8.824	0.405,
318	2	21.221	0.3[illegible].8,	20.[illegible]06	0.379,	21.197	0.312,
319	2	22.167	0.134,	19.581	0.[illegible]78,	23.527	0.098,
320	2	10.[illegible]95	0.117,	7.409	0.522,	8.142	0.302,
321	1	13.596	0.431,	13.[illegible]62	0.267,	13.935	0.363,
322	3	15.[illegible]34	0.059,	11.[illegible]85	0.386,	11.123	0.555,
323	3	23.[illegible]63	0.[illegible]49,	19.[illegible]34	0.[illegible]7,	18.655	0.544,
324	3	22.729	0.[illegible]9,	19.[illegible]78	0.441,	19.664	0.451,
325	3	13.[illegible]37	0.345,	19.593	0.[illegible]21,	18.[illegible]99	0.445,
326	2	178.[illegible]3[illegible]	0.371,	177.797	0.499,	180.476	0.131,
327	3	22.[illegible]53	0.[illegible]62,	19.425	0.361,	18.484	0.577,
328	3	18.[illegible]78	0.127,	18.[illegible]46	0.176,	13.298	0.697,
329	2	19.[illegible]16	0.[illegible]33,	17.[illegible]09	0.558,	19.[illegible]95	0.239,
330	2	18.[illegible]76	0.[illegible]1,	14.974	0.[illegible]40,	16.78[illegible]	0.259,
331	1	15.[illegible]26	0.521,	16.411	0.[illegible]89,	13.957	0.069,
332	2	22.[illegible]47	0.[illegible]35,	21.[illegible]35	0.[illegible]86,	22.[illegible]89	0.[illegible]75,
333	2	13.[illegible]79	0.[illegible]44,	11.[illegible]87	0.[illegible]9[illegible],	12.542	0.306,
334	2	14.315	0.124,	11.765	0.444,	11.819	0.432,
335	2	10.[illegible]02	0.134,	8.[illegible]48	0.[illegible]68,	10.193	0.237,
336	2	13.474	0.[illegible]57,	9.[illegible]22[illegible]	0.[illegible]70,	9.258	0.467,
337	2	18.[illegible]93	0.160,	15.663	0.553,	17.[illegible]35	0.281,
338	1	44.345	0.[illegible]02,	45.962	0.[illegible]34,	52.[illegible]45	0.[illegible]15,
339	2	25.[illegible]91	0.[illegible]24,	23.[illegible]26[illegible]	0.[illegible]95,	23.481	0.[illegible]1[illegible],
340	2	29.[illegible]3[illegible]	0.[illegible]48,	28.[illegible]46	0.561,	32.492	0.[illegible]91,
341	2	27.311	0.[illegible]54,	26.[illegible]88	0.[illegible]03,	27.[illegible]28[illegible]	0.343,
342	3	17.[illegible]49	0.[illegible]33,	16.[illegible]22	0.[illegible]33,	15.[illegible]83	0.[illegible]32,
343	2	22.[illegible]79	0.[illegible]10,	19.446	0.556,	23.[illegible]5[illegible]	0.[illegible]23,
344	2	13.[illegible]64[illegible]	0.295,	12.773	0.454,	13.[illegible]59	0.251,
345	2	18.[illegible]73	0.[illegible]05,	17.541	0.388,	17.765	0.347,
346	1	16.[illegible]91	0.[illegible]65,	17.626	0.[illegible]29[illegible],	19.[illegible]12	0.145,
347	2	23.[illegible]19	0.[illegible]27,	18.153	0.608,	20.532	0.185,
348	2	25.[illegible]56	0.[illegible]44,	22.760	0.611,	24.[illegible]96	0.245,
349	2	31.[illegible]05	0.[illegible]47,	27.[illegible]43	0.525,	27.552	0.428,
350	2	15.[illegible]16	0.[illegible]73,	15.614	0.626,	17.[illegible]75	0.[illegible]01,
351	2	24.[illegible]92	0.[illegible]39,	22.248	0.630,	25.386	0.131,
352	2	24.[illegible]98	0.[illegible]05,	20.223	0.525,	20.[illegible]15	0.[illegible]41[illegible],
353	3	105.264	0.[illegible]4,	1[illegible].870	0.[illegible]38,	94.439	0.957,
354	2	23.286	0.[illegible]47,	23.325	0.558,	24.[illegible]11	0.396,
355	2	19.[illegible]60[illegible]	0.243,	17.477	0.668,	21.621	0.[illegible]84,
356	2	36.336	0.[illegible]28,	29.932	0.879,	34.424	0.[illegible]93,
357	2	25.[illegible]52	0.[illegible]29[illegible],	24.[illegible]39	0.494,	26.493	0.[illegible]16,
358	2	31.706	0.[illegible]71,	26.283	0.604,	28.111	0.266,
359	2	32.[illegible]78	0.[illegible]67,	27.779	0.557,	23.567	0.376,
360	2	19.[illegible]23[illegible]	0.[illegible]53,	14.[illegible]54	0.603,	15.745	0.339,
361	2	17.839	0.[illegible]67,	16.399	0.547,	18.473	0.194,
362	2	13.64[illegible]	0.295,	12.773	0.454,	13.959	0.251,

353	2	21.562	0.119,	17.094	0.704, 21.198 0.124,
354	2	24.352	0.135,	18.134	0.547, 19.246 0.278,
355	2	23.306	0.255,	12.587	0.479, 13.644 0.255,
356	2	21.247	0.129,	16.272	0.517, 19.134 0.353,
357	2	19.755	0.193,	17.236	0.481, 18.113 0.326,
358	2	18.273	0.340,	10.195	0.381, 10.771 0.271,
359	2	18.222	0.175,	16.599	0.435, 16.957 0.367,
371	2	26.255	0.127,	24.218	0.557, 23.797 0.417,
371	2	2 .917	0.174,	21.063	0.459, 53.185 0.137,
372	2	33.253	0.265,	31.351	0.667, 36.643 0.149,
373	2	34.330	0.147,	32.820	0.511, 33.874 0.312,
374	2	43.503	0.193,	36.592	0.886, 44.912 0.214,
375	2	43.431	0.335,	35.985	0.841, 42.781 0.126,
376	1	32.635	0.356,	32.322	0.290, 38.131 0.216,
377	1	44.316	0.376,	43.213	0.181, 44.022 0.121,
378	1	32.333	0.287,	33.043	0.414, 39.130 0.126,
379	2	29.211	0.267,	27.352	0.677, 32.324 0.150,
382	1	28.199	0.529,	29.119	0.334, 33.981 0.137,
381	2	32.632	0.146,	27.182	0.793, 33.369 0.161,
382	2	45.548	0.341,	44.739	0.494, 47.099 0.165,
383	2	29.177	0.190,	26.732	0.647, 29.025 0.157,
384	2	23.494	0.277,	21.904	0.596, 25.701 0.147,
385	2	3 .385	0.198,	26.119	0.775, 34.865 0.127,
386	1	3 .3 1	0.520,	3 .869	0.435, 35.643 0.137,
387	2	4 .743	0.241,	38.513	0.736, 45.491 0.122,
388	2	3 .1 6	0.471,	35.977	0.542, 41.824 0.127,
389	2	31 . 7	0.276,	28.733	0.623, 31.473 0.164,
391	2	31.3 4	0.153,	28.341	0.793, 33.799 0.153,
391	2	33.26	0. 7 ,	3 .8 1	0.785, 34 .68 0.139,
392	2	35.235	0.329,	34.197	0.552, 37.259 0.119,
393	2	43.312	0.197,	36.5 6	0.877, 43.574 0.126,
394	3	25.154	0.259,	22.761	0.217, 24.374 0.715,
395	3	28.826	0.254,	28.994	0.234, 27.421 0.512,
396	2	43.512	0.151,	41.8 5	0.541, 42.174 0.417,
397	3	19.831	0.167,	24.5 4	0.133, 17.247 0.8 ,
398	3	43.135	0.171,	43.625	0.155, 43 .72 0.375,
399	3	25.331	0.233,	27.347	0.123, 24.133 0.614,
401	3	34.431	0.125,	30.152	0.228, 27.378 0.747,
401	1	33.543	0.797,	33.864	0. 62, 37.3 3 0.141,
402	3	23.536	0.299,	24.671	0.197, 22.796 0.5 3,
403	1	2 .717	0.4 5,	21.277	0.3 7, 21.4 6 0.288,
404	1	18.571	0.570,	19.525	0.164, 18.781 0.236,
405	3	43.228	0.5 8,	38.744	0.175, 33.729 0.917,
406	3	33.33	0. 23,	25.599	0.175, 2 .466 0.4 7,
407	3	19.833	0.377,	21.818	0.142, 1 .134 0.404,
408	2	3 .142	0.3 8,	29. 46	0.533, 31.471 0.159,
409	3	24.335	0.246,	24.157	0.313, 23.369 0.441,
411	3	28.362	0.159,	25.185	0.3 , 23.652 0.645,
411	1	17.9 3	0.1 ,	18.754	0.333, 2 .269 0.156,
412	2	17.490	0.328,	1 .311	0.593, 2 .337 0.179,
413	1	23.427	0.491,	23.879	0.392, 23.3 1 0.127,
414	1	43.31	0.443,	44.925	0.148, 43.73 0.359,
415	2	26.442	0.169,	23.572	0.711, 27.147 0.119,
416	2	2 .428	0.224,	24.899	0.478, 25.827 0.3 ,
417	2	39.244	0.359,	38.484	0.539, 42.033 0.192,
418	2	27.753	0.147,	25.383	0.445, 23.759 0.438,
419	1	31.277	0.279,	33. 42	0.217, 33.377 0.145,
421	2	41.471	0.4 4,	41.453	0.432, 43.198 0.104,
421	2	23.3 3	0.266,	22.582	0.532, 24.524 0.2 2,
422	2	19.2 5	0.145,	16.792	0.6 9, 19.368 0.145,

423	1	14.2[illegible]	.[illegible]535,	15.[illegible]3	.0318,	16.867	.0146,
424	2	26.137	.0163,	25.341	.0668,	27.978	.0177,
425	1	22.992	.0494,	23.284	.0452,	26.784	.0174,
426	2	14.8[illegible]	.0186,	12.222	.0577,	15.418	.0137,
427	2	33.[illegible]71	.0[illegible]28,	26.849	.0951,	34.047	.0121,
428	1	26.249	.0[illegible]5,	29.198	.0184,	34.858	.0111,
429	2	33.[illegible]6[illegible]	.0167,	3[illegible].460	.0746,	34.762	.0187,
430	2	27.[illegible].15	.0192,	24.307	.0722,	28.625	.0[illegible]6,
431	2	25.83.[illegible]	.0136,	21.033	.0748,	25.32[illegible]	.0110,
432	2	15.377	.0103,	12.[illegible]72	.0767,	18.537	.0145,
433	2	17.337	.0173,	14.353	.0777,	19.87[illegible]	.0149,
434	2	37.[illegible]33	.0472,	37.[illegible]73	.0499,	42.799	.0129,
435	2	21.[illegible]62	.0[illegible]79,	16.[illegible]95	.0747,	19.913	.0174,
436	2	14.737	.0[illegible]14,	14.[illegible]54	.0555,	19.939	.0[illegible]31,
437	2	35.[illegible]5[illegible]	.0[illegible]29,	33.684	.0576,	36.595	.0134,
438	2	37.[illegible]53	.0[illegible]29,	3[illegible].[illegible]29	.0827,	34.3[illegible]8	.0144,
439	2	34.[illegible]95	.0[illegible]8,	3[illegible].295	.0798,	34.[illegible]47	.0122,
440	2	18.[illegible]63	.0[illegible]30,	18.615	.0525,	23.837	.0[illegible]39,
441	2	2[illegible].125	.0[illegible]74,	19.[illegible]03	.0[illegible]47,	21.375	.0156,
442	1	24.[illegible]30	.0[illegible]59,	26.[illegible]17	.0335,	29.119	.0[illegible]75,
443	2	21.[illegible]35	.0[illegible]30,	17.[illegible]32	.0796,	21.877	.0116,
444	2	26.[illegible]5[illegible]	.0[illegible]06,	22.[illegible]42	.0679,	28.[illegible]7	.0[illegible]35,
445	1	27.583	.0322,	31.[illegible]32	.0146,	34.112	.0131,
446	2	16.343	.0[illegible]13,	15.747	.0550,	21.511	.0[illegible]31,
447	1	34.[illegible]3[illegible]	.0[illegible]03,	36.672	.0[illegible]29,	37.661	.0128,

GROUP		1	2	3
3				
CASE				
1	3	1[illegible]5.93[illegible]	155.775 .0[illegible]54,	174.477 .0936,
2	3	[illegible].[illegible]54 .0[illegible]2[illegible],	16.790 .0371,	18.[illegible]52 .0[illegible]43,
3	1	[illegible].[illegible]9 .0[illegible]15,	11.[illegible]62 .0218,	11.[illegible]36 .0[illegible]66,
4	3	12.[illegible]3[illegible] .0[illegible]55,	14.491 .0[illegible]63,	[illegible].448 .0762,
5	3	[illegible].[illegible]42 .0[illegible]94,	[illegible].[illegible]22 .0[illegible]71,	15.695 .0[illegible]38,
6	3	15.734 .0[illegible]37,	15.166 .0[illegible]80,	1[illegible].413 .0[illegible]67,
7	3	24.[illegible]47 .0[illegible]49,	25.[illegible]53 .0[illegible]134,	22.793 .0[illegible]62,
8	3	16.729 .0[illegible]62,	18.[illegible]32 .0[illegible]84,	13.049 .0754,
9	1	22.639 .0[illegible]47,	25.[illegible]64 .0145,	23.197 .0[illegible]68,
10	3	[illegible].[illegible]7[illegible] .0[illegible]12,	52.[illegible]97[illegible] .0[illegible]52,	49.229 .0[illegible]56,
11	2	1[illegible].[illegible]32 .0[illegible]92,	11.[illegible]89 .0482,	11.971 .0[illegible]26,
12	3	[illegible].[illegible]62[illegible] .0[illegible]73,	27.[illegible]76 .0443,	27.725 .0[illegible]59,
13	2	[illegible].[illegible]53 .0[illegible]15,	22.[illegible]75[illegible] .0[illegible]86,	[illegible]3.[illegible]28 .0[illegible]98,
14	3	2[illegible].[illegible]3[illegible] .0[illegible]3[illegible],	19.[illegible]25 .0[illegible]26[illegible],	17.[illegible]3[illegible]4 .0[illegible]39,
15	3	2[illegible].[illegible]57[illegible] .0[illegible]39,	[illegible].[illegible]73 .0[illegible]113,	22.[illegible]9[illegible] .0[illegible]51,
16	2	[illegible].[illegible]47 .0[illegible]42,	[illegible].[illegible]5[illegible] .0[illegible]489,	1[illegible].942 .0[illegible]89,
17	3	31.[illegible]33 .0[illegible]31[illegible],	33.[illegible]63 .0[illegible]16,	3[illegible].463 .0584,
18	2	19.[illegible]75 .0[illegible]203,	18.[illegible]97 .0[illegible]49,	19.[illegible]1 .0[illegible]322,
19	2	1[illegible].[illegible]34 .0[illegible]211,	17.472 .0421,	17.[illegible]74[illegible] .0[illegible]308,
20	2	2[illegible].[illegible]02 .0[illegible]199,	27.312 .0[illegible]676,	[illegible].684 .0125,
21	3	3[illegible].777 .0[illegible]23,	37.191 .0[illegible]83,	32.425 .0[illegible]895,
22	3	22.[illegible]42 .0[illegible]2[illegible]3,	23.[illegible]4 .0257,	21.979 .0451,
23	3	31.[illegible]3[illegible] .0[illegible]1[illegible]7,	31.95[illegible] .0165,	27.990 .0728,
24	2	2[illegible].[illegible]77[illegible] .0[illegible]362,	2[illegible].[illegible]7 .0393,	27.547 .0245,
25	2	2[illegible].[illegible]57[illegible] .0[illegible]78,	25.459 .0491,	25.812 .0411,

NUMBER OF CASES CLASSIFIED INTO GROUP -

GROUP	1	2	3
1	17	7	4
2	94	276	77
3	2	5	15

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