

OBSERVED CLASSROOM BEHAVIORS
AND PERSONALITY TYPES OF
178 BEGINNING TEACHERS

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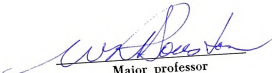
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ABSTRACT

OBSERVED CLASSROOM BEHAVIORS AND PERSONALITY TYPES OF 178 BEGINNING TEACHERS

By

Sally Ann Brickner, O.S.F.

This study was designed to investigate the relationship between the organizational structure of self-perceived attitudes, needs, and beliefs of beginning teachers and direct observations of overt behaviors in their elementary school classrooms. It was conjectured that accurate reports of self-perceptions and unbiased records of overt classroom behaviors would be congruent. That is, personalities of teachers would be consistent with the learning environments observed in their classrooms. Answers to the following questions were sought:

1. What personality types can be identified by investigating the patterns of response of beginning teachers to items regarding their attitudes toward children and teaching, their needs and manner of believing?



2. What learning environments are observable in the elementary school classrooms of these teachers?
3. To what extent are the personalities of teachers consistent or congruent with overt behaviors observed in their elementary school classrooms?
4. Do the learning environments observed in elementary school classrooms of beginning teachers differ between male and female teachers or the separate grade levels they teach?

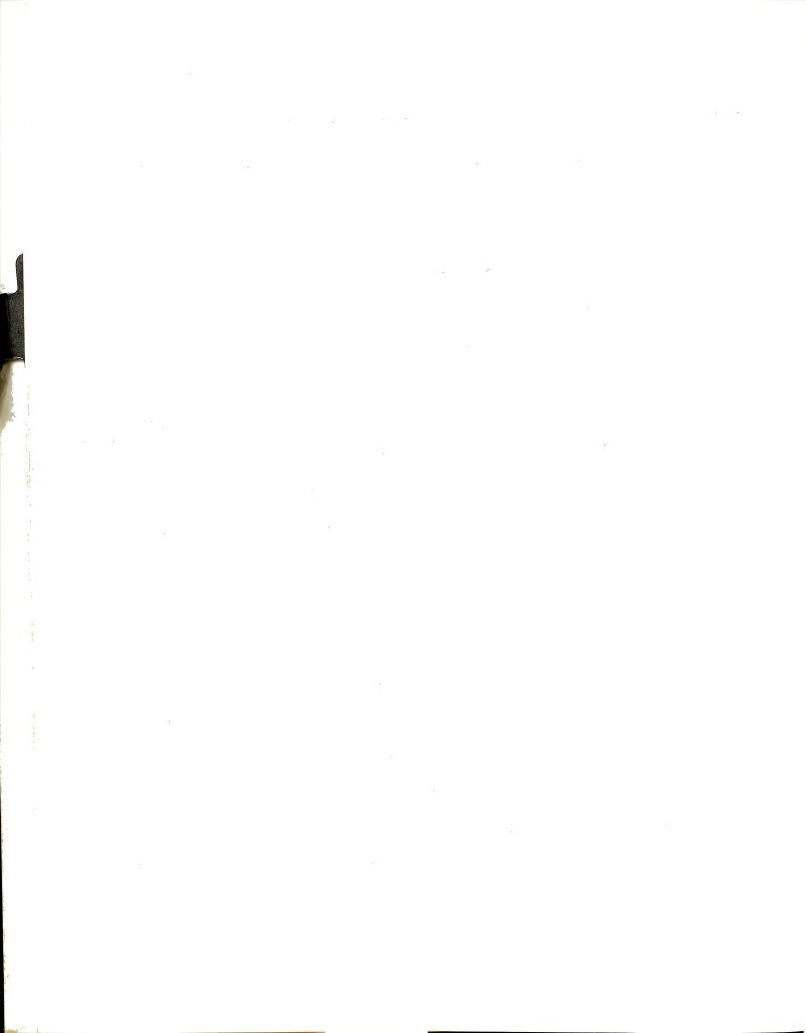
Data were gathered in two phases from 178 participants in the Elementary Intern Program of Michigan State University. Subjects entering EIP in Fall, 1967 and Winter, 1968 responded to three personality inventories: the Minnesota Teacher Attitude Inventory, the Edwards Personal Preference Schedule, and a short form of the Rokeach Dogmatism Scale. Approximately 1-1/2 years later, thirty-seven trained observers recorded overt classroom behaviors of these individuals during the final six weeks (May-June, 1969) of their teaching internship in public elementary schools of southern Michigan. The Observation Schedule



and Record (OScAR III) was employed as a standardized recording form for each of the six observations per intern teacher.

A random sample of eighty-eight subjects was drawn from the population. Q-type factor analysis was employed to identify persons who had similar score patterns on the MTAI, fourteen manifest needs of the EPPS (Absement was omitted from the analysis) and the Rokeach Dogmatism Scale. Two personality types were identified by analyzing the factor loadings of individuals on the first rotated solution which accounted for 92% of the total variance. The characteristics of teachers assigned to each personality type were determined by means of weighted standard scores. Regression coefficients for each of the sixteen personality variables were computed by means of unrestricted least squares. On the basis of the regression coefficients the personality type of each intern in the sample was predicted. One hundred forty-six interns were classified as Self-Centered; thirty-two interns were identified as Well-Integrated.

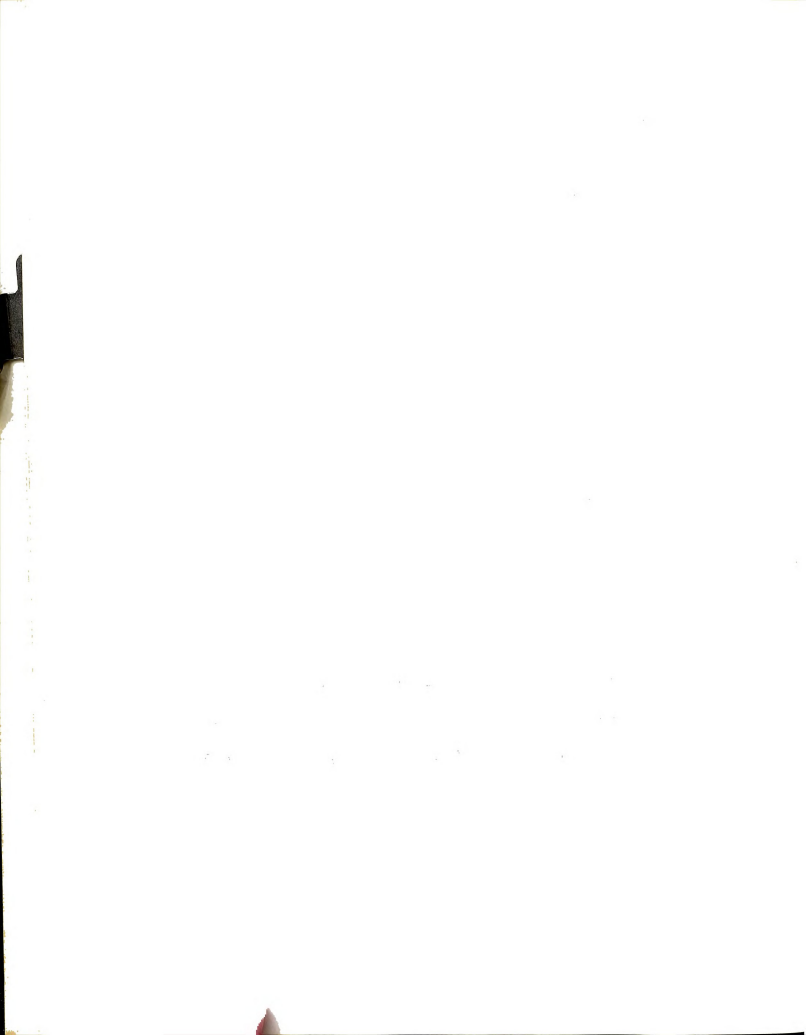
The one hundred categories of overt classroom behaviors were also submitted to factor analysis (R-type)



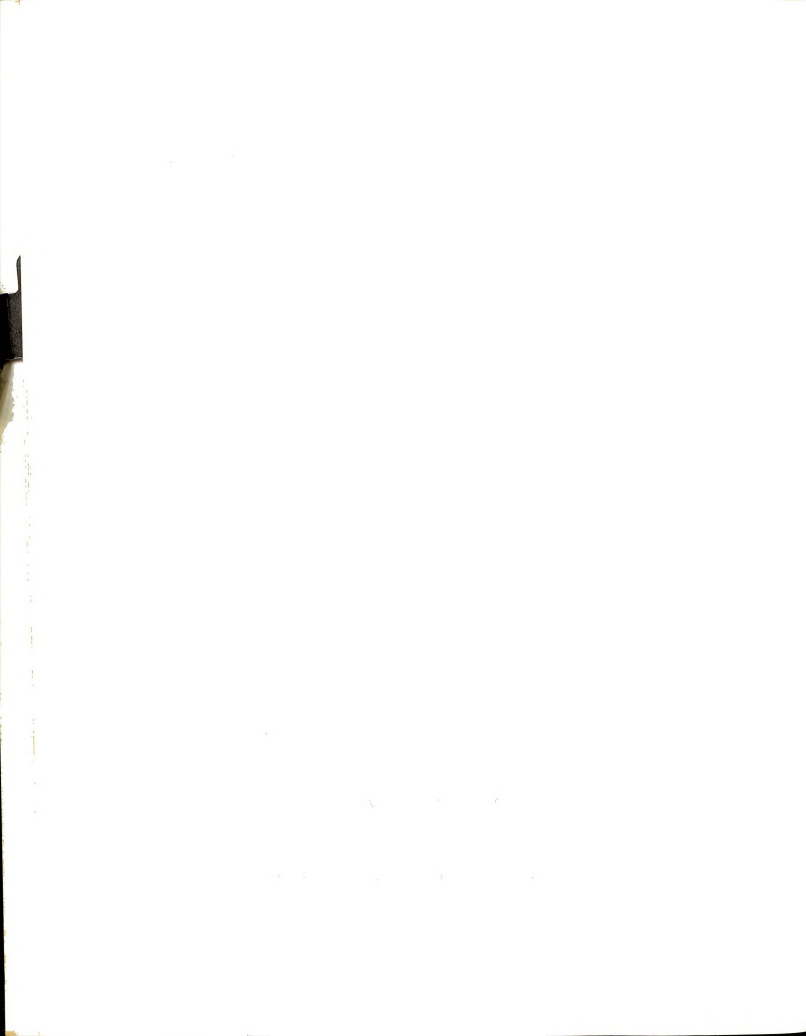
using principal components and orthogonal rotations. The fourth rotated solution accounting for twenty-five percent of the total variance was selected for further study. Using the factor loadings, five learning environments were described: Supportive, Conventional, Independent, Enriched, and Hostile. Factor scores for each of the 178 intern teachers on each of the five learning environments were computed.

Relationships between teacher-personality types and learning environments identified in the factor analyses were hypothesized. Multivariate analysis of variance was used to test significance of differences in mean vectors of each personality type across the five learning environments. Sex and teaching level differences were also investigated. A fiducial level of five percent for rejection of the null hypothesis was selected. Scheffe' post hoc comparisons of mean discriminant scores completed the investigation of significant findings for sex and teaching levels.

The following conclusions were derived from the investigation:



1. Factor analytic techniques could be employed to parsimoniously describe personality and classroom observation variables.
2. Learning environments of Well-Integrated intern teachers did not differ significantly from learning environments of Self-Centered intern teachers identified in this study.
3. Learning environments of male intern teachers of this sample differed significantly from those of female intern teachers. Learning environments in classrooms of male teachers were observed as more Supportive, Conventional, and Enriched while those of female intern teachers were observed as more Independent and Hostile.
4. Learning environments were significantly different among various teaching levels for this sample of elementary intern teachers. Grades 6-8, 3-5, and 3-8 were observed to have more Enriched, Supportive, and Conventional learning environments than K-2 classes. Grades K-2 and Special Education



Sally Ann Brickner

classes combined were observed as more Enriched, Hostile, and Independent learning environments than grades 6-8 or grades 3-8. The latter teaching levels showed more Supportive learning environments.



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CHAPTER I

NATURE OF THE INVESTIGATION

Theoretical Basis for the Study

Every teacher is an impact teacher.¹ What he knows is important; so is what he does. But his whole self, his personality has the real impact.² The learning environment of children is touched, for good or for ill, by "who and what" the teacher is.

How do we know what a teacher is like? Snygg and Combs suggest that the outsider must observe the individual and infer from that observed behavior the phenomenal self.³ Admittedly, such observation merely approximates the real phenomenal self which only the individual

¹Raymond H. Reno, The Impact Teacher (St. Paul: 3M Education Press, 1967) 53.

²J. W. Getzels and P. W. Jackson, "The Teacher's Personality and Characteristics," Handbook of Research on Teaching, ed. by N. L. Gage (Chicago: Rand McNally, 1963), 506.

³All perceptions of the self a person has at a particular instant is called the phenomenal or perceived self.



knows.⁴ However, observations of overt behaviors can be supplemented with the individual's own perceptions of himself, thus providing as complete a picture of a person as limited humans can obtain.

Therefore two forms of observation of behavior can be distinguished: indirect and direct. The former includes personal reflections, reactions, expressions by an individual regarding his own attitudes, interests, beliefs, needs, motives, and actions. The latter concerns the perceptions by an outside source of the overt behavior of the individual.⁵

To the extent that beliefs, attitudes, interests, and needs of an individual are congruent with his overt behavior we can say that the person behaves consistently. If an individual accurately reports his perceptions of himself and if an outsider makes unbiased observations of overt behaviors of the same person, the indirect and direct observations should be congruent or consistent.

⁴Donald Snygg and Arthur W. Combs, Individual Behavior (rev. ed.; New York: Harper & Row, Publishers, Inc., 1959), 44.

⁵David G. Ryans, Characteristics of Teachers (Washington, D.C.: American Council on Education, 1960), 21-22.



This theory of congruency is applicable to teachers in their work. If the teacher perceives himself as having positive attitudes toward children and teaching or sees himself as an open-minded individual, we would expect a learning environment in his elementary school classroom to reflect that perception. On the other hand, the teacher who perceives himself as having negative views of children and teaching or is more dogmatic probably maintains a learning environment which portrays these attitudes.

Researchers indicate that teacher personality is related to classroom social interaction. Bowers and Soar declare:

The analysis of classroom social interaction can proceed best if attention is directed to the personality characteristics of teacher and pupils. Personality traits, or as identifiable, personality patterns, are covariants in studying the differential effect on pupils of varying degrees or qualities of classroom interaction. Personality traits condition, modulate, promote certain responses from pupils; they activate, direct, formulate pupil reactions in the classroom learning situation. They are basic to teachers and pupils working together successfully in some quest for knowledge, skills, understanding and attitudes. It seems inadequate to consider classroom social interaction



independent of the teacher and pupil personality traits.⁶

The present study was designed to investigate the relationship between self-perceived attitudes, needs, and beliefs of teachers and their overt teaching behaviors.

Need for the Study

Numerous teacher-personality studies have been reported in educational literature.⁷ After reviewing recent reports, Getzels and Jackson summarized their findings.

Despite the critical importance of the problem and a half-century of prodigious research effort, very little is known for certain about the nature and measurement of teacher personality, or about the relation between teacher personality and teaching effectiveness. The regrettable fact is that many of the studies so

⁶ Norman D. Bowers and Robert S. Soar, "The Influence of Teacher Personality on Classroom Interaction," Journal of Experimental Education, XXX (June, 1962), 309.

⁷ A. S. Barr, "The Measurement and Prediction of Teaching Efficiency: A Summary of Investigations," Journal of Experimental Education, XVI (June, 1948), 203-283. S. J. Domas and D. V. Tiedman, "Teacher Competence: An Annotated Bibliography," Journal of Experimental Education, XIX (December, 1950), 99-218.



far have not produced significant results. Many others have produced only pedestrian findings. For example, it is said after the usual inventory tabulation that good teachers are friendly, cheerful, sympathetic, and morally virtuous rather than cruel, depressed, unsympathetic, and morally depraved. But when this has been said, not very much that is especially useful has been revealed. For what conceivable human interaction--and teaching implies first and foremost a human interaction--is not the better if the people involved are friendly, cheerful, sympathetic, and virtuous rather than the opposite.⁸

Distinctive features of teacher personality and of the effective teacher remain unknown, Getzels and Jackson concluded.

Nor does a dearth of recent classroom observation research exist though methodology for such studies may still be in its infancy.⁹ Numerous classroom observation systems have been developed and applied to research on teaching.¹⁰

⁸Getzels and Jackson, "The Teacher's Personality and Characteristics," 574.

⁹Donald M. Medley and Harold E. Mitzel, "Measuring Classroom Behavior by Systematic Observation," Handbook of Research on Teaching, ed. by N. L. Gage (Chicago: Rand McNally, 1963), 297-325.

¹⁰Anita Simon and E. Gil Boyer, ed., Mirrors for Behavior (Philadelphia: Research for Better Schools, Inc., Classroom Interaction Newsletter, January, 1968).



Few studies combine teacher personality and systematic observation of overt teaching behaviors. Existent reports usually focus on one dimension of teacher personality such as authoritarianism, dogmatism, attitudes, needs. But if personality means the teacher as a unique whole or refers to the dynamic organization of attitudes, needs, and beliefs of the teacher then the more dimensions included in a study, the more information gained about the teacher's personality. Furthermore, the structure of teacher personality more than any one dimension would seem to be related to overt teaching behaviors.¹¹

If common organizational structures of teacher personality could be identified, if overt classroom behaviors of teachers having similar personality profiles were congruent with their expressed attitudes, needs, and beliefs, then selection of candidates and prediction of their effectiveness in teaching would be facilitated. The constantly increasing number of applicants for teacher

¹¹Ira J. Gordon, Relationships Between Personality Variables and Classroom Behavior of Teaching Interns (Gainesville, Florida: University of Florida, 1964), U.S. Department of Health, Education, and Welfare, Project Number 1717, 8-9.



education programs, the shortage of funds for educating teachers, the saturation of teachers on the job market require an answer to the selection problem.

Scope and Definition of the Problem

This study investigated the relationship between the organizational structure of self-perceived attitudes, needs, and beliefs of beginning teachers and direct observations of overt behaviors in their elementary school classrooms. Answers to the following questions were sought:

1. What personality types can be identified by investigating the patterns of response of beginning teachers to items regarding their attitudes toward children and teaching, their needs and manner of believing (indirect observations)?
2. What learning environments are observable in the elementary school classrooms of these teachers (direct observations)?



3. To what extent are the personalities of teachers consistent or congruent with overt behaviors observed in their elementary school classrooms?

Sex of the teacher and teaching level: primary, intermediate, upper-elementary, or special education, could be relevant variables. Besides studying congruency between indirect and direct observations of teacher behaviors, another question was investigated:

4. Do the learning environments observed in elementary school classrooms of beginning teachers differ between males and females or among the separate grade levels they teach?

Basic Assumptions

Several basic assumptions must be made when theorizing about the relationship between self-perceptions of teachers and direct observations of their overt teaching behaviors.



1. Teachers can accurately report perceptions of their attitudes and interests, needs, and manner of believing.
2. Paper-pencil inventories can be used to validly assess the attitudes, needs, and manner of believing of beginning teachers.
3. Teacher behaviors in their elementary school classrooms are observable.
4. Teacher behavior is characterized by some degree of consistency.
5. Teacher behaviors are classifiable qualitatively and quantitatively.
6. Relatively unbiased observations of overt behaviors of teachers in their elementary school classrooms can be made if an objective form for recording behaviors and adequately trained observers are employed.



Summary of Procedures

The Study Sample

The sample for this study included 178 pre-service teachers who participated in the Elementary Intern Program (EIP) of Michigan State University during 1967-1969. These individuals elected EIP after completing approximately two years of college. The last two years of their teacher preparation program consisted of: (1) a pre-intern year devoted to academic work in liberal arts, study of methods of teaching and student teaching, and (2) a year of internship during which each person assumed full responsibility for instruction of pupils in a public school affiliated with MSU-EIP. During this final year, an intern consultant guided five or six intern teachers.

Collection of Data

During the first week of their methods courses and prior to contact with children in elementary school



classrooms, the 178 pre-interns (EIP enrollees for 1967-1968) completed the following inventories:¹²

1. Teacher Education Inventory--an instrument devised to collect specific demographic data on students enrolled in the Elementary Intern Program.
 2. Minnesota Teacher Attitude Inventory (MTAI)--a personality measure designed to predict the type of social climate the teacher will maintain in the classroom.
 3. Dogmatism Scale--a short form of the instrument developed by Milton Rokeach to measure the open-closedness of cognitive belief systems.
 4. Edwards Personal Preference Schedule (EPPS)--an ipsative scale which purports to measure fifteen manifest needs of the respondent, and his consistency in responding to the items.
-

¹² Descriptions of the personality inventories and the classroom observation form are included in Chapter III.



Thirty-seven intern consultants were trained in the use of the Observation Schedule and Record (OScAR III)¹³ by means of filmed episodes of classroom behaviors. The intern consultants observed and recorded their intern teachers' overt classroom teaching behaviors in six separate observation periods during May and early June, 1969. One thousand sixty-eight observations (6 x 178) on one hundred variables were recorded.

Both the personality and the classroom observation data were coded and keypunched on computer cards in preparation for analysis on the CDC 3600 computer at Michigan State University.

Analysis of Data

Two major questions of this study focused on (1) types of teacher personality and (2) kinds of learning environments found in elementary school classrooms of

¹³ Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 278-286. A sample of the OScAR III recording form and a description of categories is included in Appendix C.



these teachers. Factor analysis was employed to investigate these questions.

To explore personality types among the intern teachers, Q-type factor analysis was used. Due to limitations in the size of the intercorrelation matrix which could be used in the computer program, eighty-eight intern teachers were randomly selected from the total sample. Fourteen EPPS scores, the MTAI score, and the dogmatism score for each of the eighty-eight subjects were factor analyzed to determine which individuals had similar response patterns on the paper-pencil personality measures. The first rotation yielded two personality types which accounted for ninety-two percent of the total variance. The characteristics of teachers assigned to each personality type were determined by means of weighted standardized scores. Regression coefficients for each of the sixteen variables included in the factor analysis were computed by means of unrestricted least squares. On the basis of the regression coefficients the personality type of each intern in the sample was predicted. One hundred forty-six interns were classified in the first personality type; thirty-two interns were grouped in the second type.



The one hundred categories of overt classroom behaviors from the Observation Schedule and Record (OScAR III) were also submitted to factor analysis (R-type) using principal components and orthogonal rotations. The fourth rotated solution was selected for further study. Using the factor loadings for each factor in this rotation, five learning environments were described: Supportive, Conventional, Independent, Enriched, and Hostile. Factor scores for each of the 178 intern teachers on each of the five learning environments were computed.

Factor analysis thus provided a parsimonious description of the data:

1. Two distinct teacher-personality types were identified by analyzing the response patterns of eighty-eight pre-interns on sixteen personality variables.
2. Five learning environments were described using the fourth rotated factor solution of overt classroom behaviors of the intern teachers.

Relationships between teacher-personality types and learning environments identified in the factor



analyses were hypothesized. Multivariate analysis of variance was employed to test significance of differences in mean vectors of each personality type across the five classroom learning environments. Sex and teaching level differences were also investigated. A fiducial level of five percent for rejection of the null hypothesis was selected. Post hoc comparisons of discriminant scores completed the investigation of the data.

Definition of Terms

Those terms related to the problem in general will be explicated first of all. Then the particular variables associated with self-perceptions of the interns and direct observations of their overt teaching behaviors will be defined. Finally, an explanation of specific terms related to the Elementary Intern Program of Michigan State University will be presented.

Self-perception.--Personal reflection, reaction, or expression of an individual regarding his attitudes, interests, beliefs, needs, motives, actions.



Direct observation.--Perception by an outside source of the overt behavior of an individual.

Teacher behavior.--The behavior, or activities of persons as they go about doing whatever is required of teachers, particularly those activities which are concerned with the guidance or direction of the learning of others.

Attitude.--Disposition of mind with regard to a fact or state; a feeling or emotion toward a fact or state.

Personality.--Totality of an individual's behavioral and emotional tendencies unique to himself; the organization of the individual's distinguishing character traits, attitudes, needs, or habits.

Dogmatism.--Degree of openness or closedness in a person's systems of belief and disbelief.¹⁴

Need.--Condition of want, desire for fulfillment when some lack prevails.

Internship (in teacher education).--A professional preparation program for teacher candidates in which

¹⁴ Milton Rokeach, The Open and Closed Mind (New York: Basic Books, Inc., 1960), 6.



interns are contracted by local school boards, assigned a carefully planned teaching load for a school year, and supervised by a highly competent teacher released from teaching to devote full time to the supervision of intern teachers.¹⁵

Elementary Intern Program (EIP).--A cooperative endeavor of personnel in public school districts, community colleges, and Michigan State University which provides academic, professional, and practical preparation of elementary teachers in a four-year program designed to integrate theory and practice in teaching.

EIP Centers.--Ten geographic locations in southern Michigan (Alpena, Battle Creek, Bay City-Saginaw, Detroit, Grand Rapids, Lansing, Livonia, Macomb, Pontiac, and Port Huron) each with a staff consisting of a center director and intern consultants who maintain relations with the cooperating school districts.

Cooperating School Districts.--Fifty-one public school districts associated with various EIP centers and

¹⁵Internships in Teacher Education (Washington, D.C.: The Association for Student Teaching, 47th Year-book, 1969), xi.



contracting intern teachers and consultants for the school year.

Intern.--Full-time teacher having complete responsibility for learning in a particular subject area and/or at a specific grade level, salaried by the school board of the cooperating school district, and supervised by an intern consultant.

Intern Consultant.--Clinical supervisor selected for competency in teaching and supervisory work salaried by the school board of the cooperating school district to aid five or six intern teachers.

Center Director.--Michigan State University faculty member and coordinator of the EIP program at one of ten locations in Michigan.

Organization of the Report

This study will be reported in the five succeeding chapters. Literature pertaining to attitudes, needs, and beliefs of teachers and direct observations of overt teaching behaviors will be reviewed first. Salient characteristics of the study sample, instrumentation, and



procedures will be presented in Chapter III. Analysis of data will be discussed in two chapters: the results of factor analyses of personality and classroom observation data (Chapter IV); and the findings of multivariate analysis of variance (Chapter V). The final chapter of the thesis summarizes the investigation, enumerates conclusions, and discusses limitations and educational implications of the study.

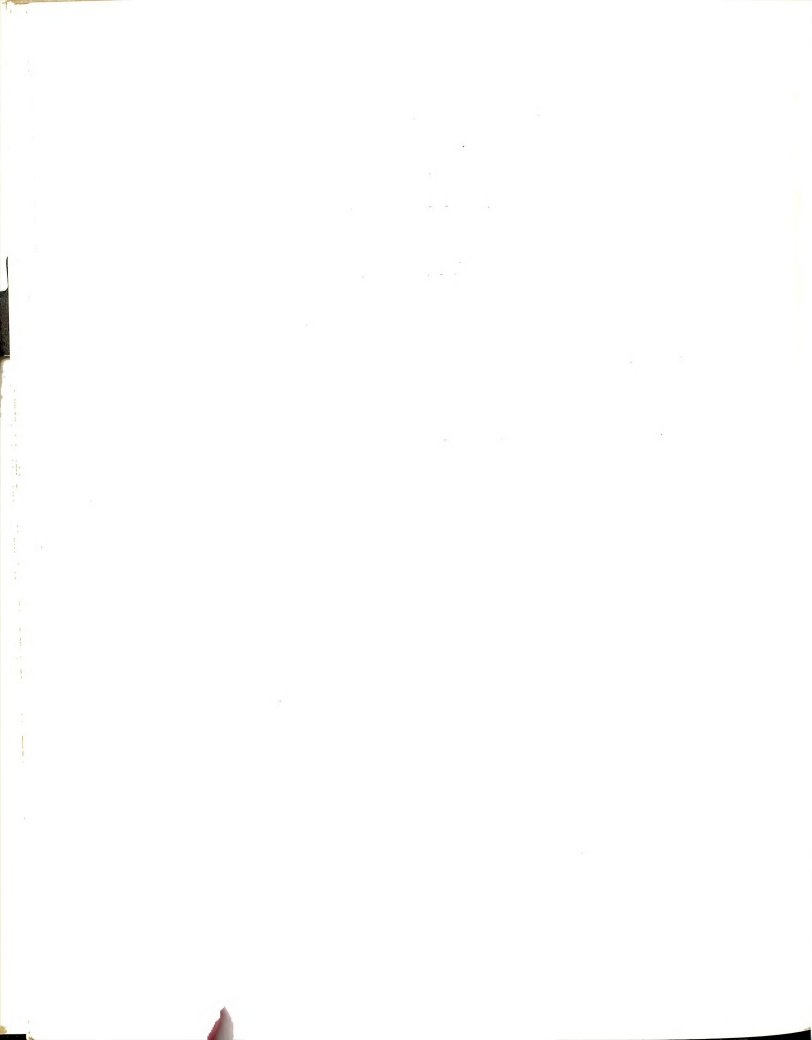


CHAPTER II

REVIEW OF RELATED RESEARCH

Introduction

Two major topics are discussed in this chapter. Under personality theory, the attitudes, needs, and beliefs of teachers are reviewed. Since congruency between felt attitudes, needs, and beliefs of teachers and their overt behaviors in the classroom is the focus of this research, effort was made to report research studies incorporating direct observations of overt teaching behaviors with assessment of personality factors. In the second section of this chapter, the method of direct observation of overt classroom behaviors is discussed. The problems associated with classroom observation research are studied and relevant research is reviewed.



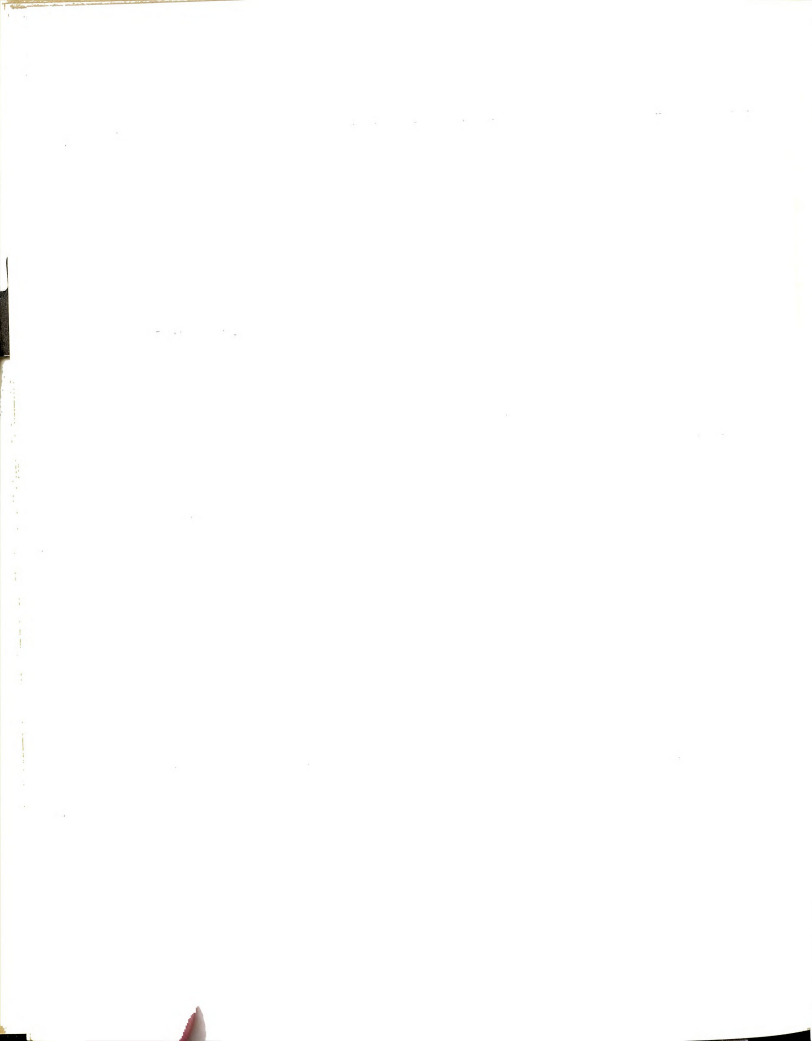
Personality Theory

Theorists view personality in two ways. Their vantage may be the individual in his life space or the individual among many individuals. The first probes individual differences, is ideographic. The second seeks general principles, is nomothetic.¹ Actually, the views are complementary rather than contradictory.

The focus of this research is the individual in the group, the teacher among his colleagues. The attitudes, needs, and beliefs of a teacher integrate within his personality structure. He is unique. But his integrated personality tends to be more like some teachers' and less like others. In short, there are typical elements in the personality structures of many individuals. Topologies, then, may be found in a group of teachers.

Though the elements of personality are interrelated, each factor investigated in this study will be considered individually. Attitudes, needs, and manner of believing will be discussed and representative research presented.

¹Robert M. Allen, Variables in Personality Theory and Personality Testing (Springfield, Illinois: Charles C. Thomas Publisher, 1965), 4-10.



Attitudes

Like personality, the concept of attitude has varied definitions. In this study, attitude will mean a "tendency or disposition to evaluate an object or the symbol of that object in a certain way."² In other words, an attitude indicates what a person's habitual mode of behavior will be. Valuation of objects ranges on a favorable-unfavorable continuum; that is, attitudes are termed favorable-unfavorable.

A teacher possesses attitudes toward any thing or person connected with his profession. If his attitudes are positive or favorable, the teacher

. . . should be able to maintain a state of harmonious relations with his pupils characterized by mutual affection and sympathetic understanding. The pupils should like the teacher and enjoy school work. The teacher should like the children and enjoy teaching.³

²D. Katz and E. Stotland, "A Preliminary Statement to a Theory of Attitude Structure and Change," in S. Koch, ed., Psychology: A Study of a Science, Vol. III, 1959, 428. Quoted in Chester A. Insko, Theories of Attitude Change (New York: Meredith Publishing Co., 1967), 2.

³Walter W. Cook, Carroll H. Leeds, and Robert Callis, "Predicting Teacher-Pupil Relations," The Evaluation of Student Teaching (Washington, D.C.: The Association for Student Teaching 28th Yearbook, 1949), 67.



On the other hand, a teacher with generally unfavorable attitudes toward children may dominate the classroom environment. If he is successful, a tense or fearful atmosphere may prevail in a situation which appears orderly. If he is unsuccessful, his nervousness and frustration may result in chaotic classroom conditions.

The Minnesota Teacher Attitude Inventory was developed to assess those attitudes of a teacher which predict how well he will relate interpersonally with children and how satisfied he will be with the teaching profession.⁴ Since its inception, many researchers have utilized the MTAI either in studies of the measuring device itself or as a predictive instrument. Description of the inventory and discussion of reliability, validity, and other pertinent characteristics of the test can be found in Chapter III. Attention will now be directed toward reported research on attitudes of the teacher as related to classroom behaviors.

Medley and Mitzel probed factors which might account for differences in (1) effectiveness of beginning

⁴Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory Manual (New York: The Psychological Corporation, 1951), 2.



teachers, and (2) persistence in teaching as a career among teacher education graduates. The MTAI was one of several tests administered to 343 education students. Forty-nine beginning teachers (of whom only three were male) were selected for further study on the effectiveness of their teaching. These individuals taught in nineteen public elementary schools in New York City. The Observation Schedule and Record (OScAR 2a) was used by six observers to record overt classroom behaviors. Twelve observations were made for each teacher. Attempts to relate observation results with predictor data gathered when the teachers were in college met with little success. The three factor scales (Emotional Climate, Verbal Emphasis, and Social Structure) seemed to account for some of the differences in teacher-pupil rapport and principals' ratings, but not for differences in pupils' achievement.⁵

A questionnaire was sent to the 343 individuals three years after their student teaching experience. Those who persisted in teaching were found to be

⁵Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 278-282.



relatively older, prepared for elementary rather than secondary teaching, and "satisfied" with student teaching as they had experienced it. A significant decrease in average MTAI score occurred over the three-year period. Two factors seemed to be associated with the decline: a shift from more extreme to less extreme opinions, and an increase in emphasis on the importance of limits to pupil behavior and maintenance of high academic standards.⁶

The Minnesota Teacher Attitude Inventory was one of several predictive measures used by Seibel when studying one hundred graduate students enrolled in a one-year Masters in Education Program. Seibel questioned the possibility of predicting the classroom behaviors of these individuals during their student teaching experience. The subjects were observed by the regular classroom teachers and their college supervisors. Following the observations, ratings of eight specific classroom behaviors were made on a Likert-type scale on which values could vary from 1 (does not exhibit) to 7 (seizes every

⁶Donald M. Medley, Harold E. Mitzel, and W. Rabinowitz, "Longitudinal Studies of a Group of Teacher Education Graduates," *Journal of Teacher Education*, X (March, 1959), 117-119.



opportunity to exhibit). A canonical correlation of .59 was obtained between the predictor and criterion variables. Seibel indicated that teacher behaviors characterized by seriousness, compliance with pupil requests, high emotional support and affectionate physical contact, allowing pupils to do things for themselves, soliciting suggestions, and some immobility combined to provide maximum predictability. Giving rewards contributed little. A teacher exhibiting these behaviors tended to have many previous leadership activities with children, a high score on the Minnesota Teacher Attitude Inventory, and a low score on the Paranoia Scale. He also viewed many pupil misbehaviors as serious. Evidence of a substantial relationship between antecedent variables and the classroom behaviors of student teachers existed, Seibel concluded.⁷

Ragsdale explored the relationship of change in student teachers' attitudes toward children's behavior and teacher-pupil relations with change in student teachers' classroom behavior during a ten-week period of

⁷D. W. Seibel, "Predicting the Classroom Behavior of Teachers," Journal of Experimental Education, XXXVI (Fall, 1967), 26-32.



student teaching. The MTAI, California F-Scale, and Ryans' Teacher Characteristics Schedule were administered to forty-nine elementary education student teachers at Anderson College, Indiana, before and after student teaching. Two trained observers used Flanders' Interaction Analysis and Ryans' Teacher Characteristics Classroom Record (Patterns X_o , Y_o , and Z_o) to record eight observations of the student teachers. No significant change in student teachers' attitudes concerning children and teaching as expressed on the predictive measures was found. A significant positive change occurred in the student teachers' classroom behaviors as measured on the Classroom Observation Record; no significant change was indicated by the Interaction Analysis data. Student teachers spent less time talking, and learned to ask questions eliciting creative responses and ideas from the pupils, observed Ragsdale. These findings indicate that classroom behavior may change significantly without a corresponding change in expressed attitudes when the same aspects of the teaching process are being measured.⁸

⁸ Elva Mae Ragsdale, "Attitude Changes of Elementary Student Teachers and the Changes in Their Classroom Behavior During Student Teaching" (unpublished Ed.D. dissertation, Ball State University, 1967), Dissertation Abstracts, XXVIII (August, 1967), 521-522 A.



Bridgman sought to identify characteristics which distinguish teachers as a group and which differentiate between effective and ineffective teaching among the teachers of New Hanover County, North Carolina. Personal and professional characteristics, attitudes, values, and creativeness were assessed. Classroom performance was measured using Ryans' Classroom Observation Record on selected teachers during the 1964-1965 school year. Product moment correlations, t-tests, and analysis of variance were used to analyze the data. Findings relevant to attitudes and classroom performance were:

1. Elementary teachers had more positive attitudes than their colleagues; females had more positive attitudes than males.
2. Teachers with positive attitudes were more creative, permissive, and social, gave higher grades, were more active professionally, and were rated higher on performance.
3. Teachers with high performance ratings had higher positive attitudes, were less



authoritarian, more creative, and had lower economic values.⁹

To discover relationships between attitudes and certain teaching behaviors, Friedman studied a sample of twelve beginning teachers, the twelve cooperating teachers with whom they served their internship, eight laboratory school teachers with whom they worked, and the two university teachers by whom they were instructed. The MTAI was used to assess teacher attitudes. Four two-hour observations were recorded by a trained observer on a specially devised Observation Checklist to describe teacher behavior. The university teachers and participating laboratory school teachers were found to have more positive attitudes toward children than beginning or cooperating teachers. The observed behaviors of the former groups were less controlling, and encouraged greater independence and assumption of responsibility by the learners than did

⁹ John Northan Bridgman, "Selected Teacher Characteristics and Their Relationships with Certain Behavior Patterns and Teaching Effectiveness" (unpublished Ed.D. dissertation, The University of North Carolina at Chapel Hill, 1967), Dissertation Abstracts, XXVIII (March, 1968), 3524 A.



behaviors of the other two groups. Significant differences between behaviors of beginning and participating teachers, between beginning and university teachers were found when overall results were considered. No such significant differences occurred between beginning and cooperating teachers.¹⁰

Furr studied the effects of feedback from observations on the verbal and nonverbal behavior of thirty-six female student teachers in the elementary school. A parallel part of his study explored the relationship between scores on the MTAI administered before and after student teaching. No significant difference was found between the experimental and control groups as a result of feedback from observations of (1) indirect and direct verbal behavior, or (2) encouraging and inhibiting nonverbal behavior. A positive correlation was found between direct verbal and inhibiting nonverbal classroom behavior. A negative shift in expressed attitudes toward children

¹⁰ L. R. Friedman, "An Investigation of Certain Teaching Behaviors of and Influences Upon New Elementary Teachers" (unpublished Ed.D. dissertation, The University of Florida, 1967), 149 pages, Dissertation Abstracts, XXIX (July, 1968), 165 A.



and teaching occurred in both groups, with a significantly greater negative shift shown by the experimental group. Furr concluded that instruction in the nature and use of category systems for recording classroom behaviors probably was not sufficient in itself to bring about significant change in verbal and nonverbal classroom behavior of elementary school student teachers.¹¹

Research was conducted by Bowers and Soar with fifty-four volunteers from two elementary school systems in Tennessee. The experimenters examined differential effects of laboratory and human relations training on teachers. Four attitude and personality inventories were completed by the subjects preceding and following laboratory and human relations training of teachers in the experimental group. Overt classroom behaviors of these teachers were recorded on Medley and Mitzel's Revised Observation Schedule and Record.¹²

¹¹Oneta Roberts Furr, "Effects of Observational Feedback on Verbal and Nonverbal Classroom Behavior of Student Teachers" (unpublished Ed.D. dissertation, North Texas State University, 1968), Dissertation Abstracts, XXIX (April, 1969), 3495 A.

¹²Norman D. Bowers and Robert S. Soar, Studies of Human Relations in the Teaching Learning Process: V: Final Report: Training for Classroom Teachers (Nashville, Tennessee: Vanderbilt University, 1961), 210 pages.



In an early phase of the study, Rippy investigated the relationships between overt classroom behaviors and teacher attitude and personality characteristics. Analysis of variance around the regression line and Pearson product moment correlations were used to test differences. Six departures from linearity and nineteen correlations significantly different from zero were observed. His study demonstrated the value of observing specific behaviors in the classroom. The psychopathic deviate, schizophrenia, and hysteria, psychastnia and hypochondriasis scales of the Minnesota Multiphasic Personality Inventory, the MTAI, and Bowers Teacher Opinion Inventory were significantly related to identifiable aspects of classroom behaviors. The first four scales had the most predictive power, however. The way in which the teacher described herself was reflected more generally in measures of pupil behavior than in measures of both teacher and pupil classroom behavior.¹³

¹³Mark Leo Rippy, Jr., "Certain Relationships Between Classroom Behavior and Personality Characteristics of Selected Elementary Teachers" (unpublished Ed.D. dissertation, George Peabody College for Teachers, 1960), 240 pages.



A coherent picture of personality resources basic to skillful teacher-pupil interpersonal relationships was outlined by Bowers and Soar on the basis of their human relations study:

. . . Skillful interaction with pupils requires on the part of the teacher responsibility, and depth of affective relationship; it requires that she be well enough adjusted that much of her energy is not drained off in dealing with her own intrapersonal tensions; and she must be able to perceive herself and others clearly and represent herself honestly in communication with others. A teacher must, in short, care; must not have this concern blocked by her own intrapersonal tensions; and must be relatively free of distorting mechanisms, and able to enter honestly into relations with others. Perhaps what this reduces to is that a teacher must be able to use her "self" openly, clearly and honestly in her interactions with pupils.¹⁴

How do we identify such an individual prior to entry into the profession? This question was analyzed in much of the research previously cited. Wilk and his colleagues were also concerned with this problem. In a carefully designed study, they explored the relationship between a student teacher's needs for integration and dominance, attitudes, and other personality variables and

¹⁴Bowers and Soar, "The Influence of Teacher Personality on Classroom Interaction," Journal of Experimental Education, XXX (June, 1962), 311.



ratings of their classroom behaviors made by supervisors and trained observers. The Miller Analogies Test, the Cooperative Reading Test, the MMPI, MTAI, and Bowers Teacher Opinion Inventory comprised the psychological measures administered prior to admission. Counselors' judgments were also used as a basis for admission to the teacher education program.

Thirty-eight female student teachers, selected from 167 individuals who participated in the interviews, were randomly assigned to public elementary schools in four geographic regions in a midwestern city. Each of five trained observers visited each student teacher once a semester. Two semesters of student teaching were required, one in lower and one in upper elementary teaching. Ten observation reports for each student teacher were collected during the two semesters of the study. Two methods of systematic observation employed were the Observation Schedule and Record (OSCAR III) and the Minnesota System of Interaction Analysis. The OSCAR items were grouped into eight scales: Teacher-Class Activities, Teacher-Individual Activities, Pupil Disruptive Behavior, Pupil-Class Activities, Pupil-Individual Activities,



Teacher-Grouping Activities, and Teacher and Pupil Use of Materials. The researchers hypothesized that a teacher's need for integrating behavior was related to indirect verbalizations and her need for dominance was related to direct verbalizations. Interaction analysis was used to assess indirect and direct teacher talk. The major findings related to the current investigation were:

1. Teachers were more often observed giving positive attention and encouragement to individual pupils during their upper elementary teaching than when in lower elementary teaching.
2. At the upper level, teachers more often used direct questions or answered a pupil's question rather than ignoring it.
3. As student teachers gained experience, they took more active roles in directing the class, and students became more passive participants.
4. The variety of activities in which pupils led the class was greater when student teachers taught in the lower grades rather than upper grades.
5. Student teachers and pupils made more use of a variety of materials when teaching in lower grades rather than upper grades.
6. Student teachers who preferred upper grade levels had significantly better Classroom Emotional Climate scores when they taught in the upper grades. Those who preferred the lower grades showed no change in scores at the different levels.



7. Student teachers preferring the lower grades had a higher mean Classroom Verbal Emphasis score than those preferring upper grades. All student teachers, regardless of preference, had higher Verbal Emphasis scores when they were in the upper grades.
8. Significantly less disruptive pupil behavior occurred in classrooms where the level and variety of pupil-class activities were high, and where the student teachers' work with the individuals was observed to be interested, helpful and supportive.
9. Student teachers' need for integration and security could be predicted from MTAI scores and sophomore honor point ratio. Students who had greater command of the subject matter and who had certain attitudinal dispositions allowed students to respond freely. They could accept pupil feeling, could support, praise, and encourage pupils.

This research again supported the supposition that personality factors relate to the behaviors of elementary teachers in their classroom.¹⁵

¹⁵Roger E. Wilk, William H. Edson, Don Davies, and Naomi Chase, A Study of the Relationship Between Observed Classroom Behaviors of Elementary Student Teachers, Predictors of These Behaviors, and Ratings by Supervisors (Minneapolis, Minnesota: University of Minnesota, 1962), 78 pages plus appendices.



Needs

Murray heightened interest in the construct of needs in his major work, Explorations in Personality.¹⁶

He defined a need as:

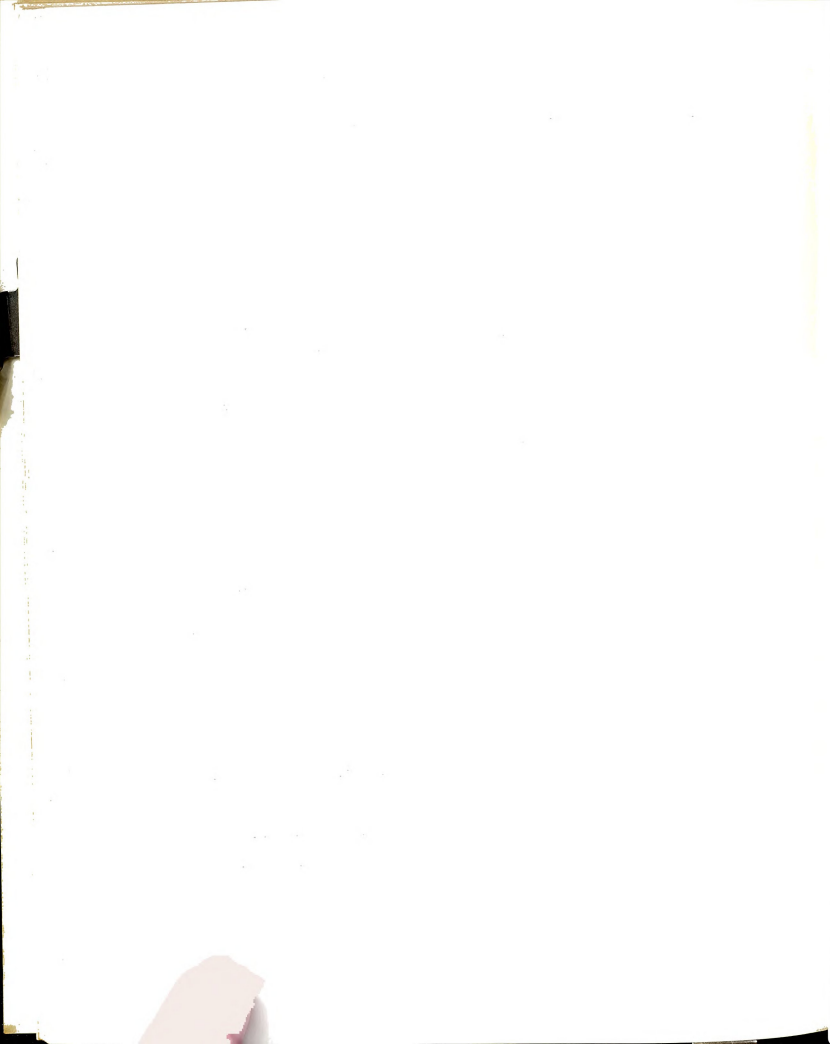
. . . a construct which stands for a force in the brain region, which organizes . . . action so as to transform in a certain direction an existing, unsatisfying situation . . .¹⁷

Several principles basic to Murray's personality theory are incorporated in this definition. The brain unifies man's personality since "need" centers in the brain region. This "need," whether a force or an emotional charge, moves a man in a defined direction to reduce his dissatisfaction, whether internally or externally created. When man generates his own tension, he expresses his need for positive thrust, excitement, or movement. By reducing his tension, man expresses his need for homeostasis.

Murray established a taxonomy of needs that motivate man. For example, abasement or achievement, play or sex, exhibition or autonomy might be the forces moving man

¹⁶Henry A. Murray, Explorations in Personality (New York: Oxford, 1938).

¹⁷Ibid., 123.



to behave in a particular manner.¹⁸ Needs were classified into five types: primary and secondary, proactive and reactive, overt and covert, focal and diffuse, effect and modal.

Primary and secondary needs:

This distinction refers to states of development rather than degree of importance. Primary needs develop prior to the secondary needs. Primary needs are of a biological or organic nature while secondary needs are psychogenic. Achievement and affiliation are examples.

Proactive and reactive needs:

Proactive need originates within the person, while reactive need originates in man's environment. In the latter condition, man reacts to a stimulus. Proactive-reactive needs are bound together in a cause-effect relationship.

Overt and Covert Needs:

This distinction refers to needs which can be openly expressed (overt) as opposed to those which must be hidden (covert). Society may sanction achievement but censure aggression, for instance.

Focal and diffuse needs:

A focal need centers on one particular object or person for satisfaction. Diffuse need, such as man's need to avoid pain, covers a wide range of objects.

¹⁸ Ibid., 152-226.



Effect and modal needs:

A need which has a direct or specific goal is termed an effect need. But the process by which we achieve the effect may equal or exceed the importance of achieving that effect. This is termed a modal need.¹⁹

In this study, the secondary or psychogenic needs of beginning teachers are examined. As a background, major studies which identify specific needs of teachers will be reviewed first. Then several reports on the relationships between needs of beginning teachers and overt classroom behaviors will be summarized. Many of the studies reported utilize the Edwards Personal Preference Schedule.²⁰ The fifteen needs which this instrument purports to measure relate directly to Murray's need theory.

Jackson and Guba examined the manifest needs of 366 public school teachers in a Midwestern city. The sample of teachers included 118 males (91 secondary and 27 elementary) and 218 females (52 secondary and 196

¹⁹ Ledford J. Bischof, Interpreting Personality Theories (New York: Harper and Row, Publishers, 1964), 140-177.

²⁰ A. L. Edwards, Edward Personal Preference Schedule: Manual (Rev. ed.; New York: The Psychological Corporation, 1959). A description of the fifteen needs measured on this inventory is contained in Appendix A.



elementary). Edwards Personal Preference Schedule was administered to the subjects and the scores compared to the college norm groups on whom the test was standardized. Teachers showed significantly greater need for deference and lower need for heterosexuality than did the liberal arts norm group. Male secondary teachers and female teachers expressed significantly greater need for order and endurance, and significantly less need for exhibition.²¹ "These five needs," concluded the researchers, "appear to be more or less typical of teachers in general, at least insofar as the teacher occupational group may be different from liberal arts students."²²

The same sample of teachers was divided into groups on the basis of teaching experience (0-3 years, 4-9 years, and 10 or more years) and sex. The needs of novice, intermediate, and veteran teachers were rank-ordered for each subject. Male and female veteran teachers had markedly similar profiles; the rank order correlation was .70. Deference and order ranked highest,

²¹Philip W. Jackson and Egon G. Guba, "The Need Structure of In-Service Teachers: An Occupational Analysis," School Review, LXV (June, 1957), 176-192.

²²Ibid., 178.



and heterosexuality the lowest for this level of teaching experience. Male and female novice teachers had quite dissimilar need structures ($\rho = .19$). Young female teachers resembled older female teachers ($\rho = .71$) more closely than young male teachers' need patterns resembled their older male counterparts ($\rho = .32$).²³

Sheldon and others hypothesized that individuals scoring high on a number of "warm teacher scales" ought to have need structures different from teachers scoring very low on several of the same scales. The EPPS was one of several tests administered to twenty students (ten having very high scores and ten very low scores on the "warm teacher" tests). Among the six needs which were examined, "potentially good teachers" had significantly higher scores on affiliation and dominance and significantly lower scores on aggression, succorance, and abasement. Thus the hypothesis of their study was confirmed.²⁴

Need structures of student teachers who preferred lower elementary school classes were compared to the need

²³Ibid., 184.

²⁴M. S. Sheldon, J. M. Coale, and R. Copple, "Current Validity of the 'Warm Teacher Scales,'" Journal of Educational Psychology, L (February, 1959), 37-40.



structures of persons preferring upper elementary classes. Southworth found that abasement, affiliation, succorance, and nurturance were expressed as higher manifest needs of students who preferred the lower grades. Achievement, aggression, and exhibition were greater needs of students preferring later elementary classes.²⁵

Anderson was interested in comparing the need profiles of teachers in schools identified as having open organizational climates compared to schools with closed organizational climates. Eight elementary schools in a large southern school district were used in the study. School climate was determined by administering Halpin and Croft's Organizational Climate Description Questionnaire to the faculty members. Seventy-one teachers taught in schools having open organizational climates, and fifty-five teachers taught in schools having closed climates. No significant differences in need profiles were observed. Analysis of extreme cases did not reverse the finding. When each need was examined by means of t-tests, teachers

²⁵Horton C. Southworth, "A Study of Certain Personality and Value Differences in Teacher Education Majors Preferring Early and Later Elementary Teaching Levels" (unpublished Ed.D. dissertation, Michigan State University, 1962).



in open organizational climates were found to have significantly less need for intraception and abasement than faculty members in closed organizational climates.²⁶

The manifest needs of student teachers were compared to their rapport with pupils during student teaching. Ninety-one student teachers completed the EPPS prior to their student teaching experience. The Pupil Reaction Inventory, a questionnaire designed to indicate teacher-pupil rapport, was administered to their pupils following student teaching. Medley found no significant relationship between manifest needs of student teachers and pupil-teacher rapport. He then studied the twenty-five individuals who scored less than eleven points on the consistency scale of the EPPS. He hypothesized that these teachers were being honest and expressing their true needs, while the other sixty-six student teachers knew how to fake on personality tests. A correlation of .76 between the needs of "inconsistent" respondents and

²⁶Donald Anderson, "A Comparison of Edwards Personal Preference Schedule Patterns of Elementary School Teachers in Open and Closed Organizational Climates" (unpublished Ed.D. dissertation, Auburn University, 1966), 104 pages. Also see, Donald D. Anderson, "Personality Attributes of Teachers in Organizational Climates," Journal of Educational Research, LXII (July, 1969), 441-443.



pupil-teacher rapport was found. Intraception, achievement, aggression, and abasement correlated positively with teacher-pupil rapport and heterosexuality correlated negatively. Beta coefficients for the first four needs were significant at the .01 level and for heterosexuality at the .05 level. Here, concluded Medley, is a picture of the successful teacher as she perceives herself.²⁷

Using sociometric nominations of beginning education students at North Texas State University, Clary separated ninety student teachers into three groups of individuals exhibiting aggressive, submissive, or normal behavior patterns. Scores on the Edwards were then obtained for these ninety student teachers. Criterion profiles of need patterns for each group were developed on the basis of mean scores on the fifteen scales of EPPS. Finally, the twenty student teachers whose needs profiles most closely corresponded to the criterion profiles were rated by their college supervisor and supervising teacher as aggressive, submissive, or normal. Individuals identified as aggressive had a significantly greater need for

²⁷ Donald M. Medley, "Teacher Personality and Teacher Pupil Rapport," Journal of Teacher Education, XII (June, 1961), 152-156.



deference than did submissive or normal student teachers. Subjects in this study did not differ significantly from the norm group of the EPPS. No significant relationship between needs profiles of student teachers and ratings of their classroom behaviors was observed.²⁸

Four dimensions of teacher behavior were studied by Travers and his associates:

1. Achievement: degree of emphasis on academic activities and the importance of excellence;
2. Affiliation: degree of interaction with students and emphasis on warm personal relationships;
3. Control: degree to which the moment-to-moment behavior of students is controlled by the teacher;
4. Recognition: degree to which the teacher is the center of attention.²⁹

These dimensions of behavior were assessed by two methods: a sampling of one hundred verbal statements of the teacher, and observer ratings of thirty-five variables on a

²⁸Eldon Gandy Clary, "Predicting Student Teaching Behavior From Needs Profiles by Comparison with Sociometrically Defined Groups" (unpublished Ed.D. dissertation, North Texas State University, 1968), 94 pages, Dissertation Abstracts, XXIX (April, 1969), 3488-3489 A.

²⁹Norman E. Wallen, Robert M. W. Travers, Ian E. Reid, and Kenneth H. Wodtke, "Relationships Between Teacher Needs and Teacher Behavior in the Classroom," Journal of Educational Psychology, LIV (February, 1963), 23.



seven-point scale. Two samples of elementary school teachers (seventy-seven from an urban setting and forty-one from a rural setting) responded to a questionnaire and were observed in their classrooms. The questionnaire was scored on the four dimensions already mentioned, and the results compared to data from the observed behaviors. Control and Affiliation were positively related on all measures of teacher behavior. A significant negative correlation was found between the same needs as viewed by the observers. The Control need as measured on the questionnaire correlated positively with the controlling behavior of the teacher. Such behavior was related to lack of warmth and, to a lesser degree, lack of confidence on the part of the teacher. The authors concluded that the best predictive measure of performance is some type of instrument in which the teacher can answer straight and simple questions about his typical behaviors.³⁰

³⁰Robert M. W. Travers, Norman E. Wallen, Ian E. Reid, Kenneth H. Wodtke, Measured Needs of Teachers and Their Behavior in the Classroom (Salt Lake City: University of Utah, 1961, Final Report to U.S. Department of Health, Education and Welfare, Office of Education Contract No. 444 [8029]).



Gordon hypothesized that the need structure of a teacher is directly related to overt teaching behaviors, that the need structure is more important than any single need. She studied a sample of fifty elementary, twenty-three junior high, and twenty-nine senior high student teachers of the University of Florida. Randomization was not employed in the selection process. The Edwards Personal Preference Schedule, Thurstone Temperament Schedule, and two case studies were administered to the subjects. The Emotional Climate Scale of OScAR 2a was used in recording classroom behaviors. Three subscales included manifest teacher hostility, supportive teacher behavior, and disorderly pupil behavior. Means and standard deviations of the scores were computed, all variables were intercorrelated, and then submitted to varimax rotations. Three common factors (Leadership, Nurturant Affiliation, and Emotional Climate) were obtained for males, and secondary and elementary females. Dominance had a high loading for males and for secondary females; females in general had impulsive tendencies. Male subjects exhibited less need to relate to people in an emotionally supportive and helpful way. Elementary teachers engaged in more

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supportive behaviors than secondary teachers. Surprisingly, elementary female teachers manifested more hostility than female secondary teachers. Gordon concluded that factor analytic procedures rather than a variable-by-variable approach to the measurement of teacher personality seems to offer some support to the concept of differential personality organization. However, sex and teaching level should be analyzed separately.³¹ The observation schedule (OScAR) proved useful since observers could be adequately trained without undue effort.³² However, Emotional Climate seemed to be too broad a construct when comparing overt behaviors to personality characteristics; subscales indicated differences more clearly.

Beliefs

Just as Murray theorized that an individual possesses a system of needs, Rokeach theorized that a person has a unique system of beliefs.

³¹Ira J. Gordon, Relationships Between Personality Variables and Classroom Behavior of Teaching Interns (Gainesville, Florida: University of Florida, 1964), U.S. Department of Health, Education, and Welfare, Project Number 1717, 127.

³²Ibid., 131.

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The belief system is conceived to represent all the beliefs, sets, expectancies, or hypotheses, conscious and unconscious, that a person at a given time accepts as true of the world he lives in. The disbelief system is composed of a series of subsystems rather than merely a single one, and contains all the disbeliefs, sets, expectancies, conscious and unconscious, that to one degree or another, a person at a given time rejects as false.³³

For example, positively affirming belief in democracy as the best form of government for our country implies negating monarchy, oligarchy, and all other types as our form of government.

Specific to the individual is his belief-disbelief system. On the other hand, the open-closedness of belief-disbelief systems is restricted to neither individuals nor beliefs: political, economical, philosophical, religious, ethnic, or scientific. Individuals having dissimilar belief-disbelief systems sometimes act or react similarly. This phenomenon led Rokeach to say that "... it is not so much what you believe that counts, but how you believe."³⁴

³³ Milton Rokeach, The Open and Closed Mind (New York: Basic Books, 1960), 33.

³⁴ Ibid., 6.

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A person having a more open belief system evaluates and acts on information on its own merits, in accord with the structural requirements of the situation. He is governed more by his inner self-actualizing forces and less by irrational inner forces. Conversely, a person with a more closed belief system has greater difficulty distinguishing between substantive information (pertaining to the situation) and nonsubstantive or irrelevant information.³⁵

Rokeach designates the relatively closed belief system as more dogmatic. He defines dogmatism as:

(a) a relatively closed cognitive organization of beliefs and disbeliefs about reality, (b) organized around a central set of beliefs about absolute authority which, in turn, (c) provide a framework for patterns of intolerance and qualified tolerance toward others.³⁶

Three sets of variables are subsumed under the construct of dogmatism: closed cognitive systems, general authoritarianism, and general intolerance.³⁷

³⁵ Ibid., 54-70.

³⁶ Milton Rokeach, "The Nature and Meaning of Dogmatism," Psychological Review, LXI (May, 1954), 194.

³⁷ Milton Rokeach, "Political and Religious Dogmatism: An Alternative to the Authoritarian Personality," Psychological Monographs: General and Applied, LXX (Number 18, Whole Number 425, 1956), 4.

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Can this cognitive belief theory be applied to teaching? It would appear that behaviors of teachers having closed systems of belief would differ from behaviors of teachers having open systems of belief, given the same classroom situation. A more dogmatic teacher would tend to confuse relevant and irrelevant information; decisions about subsequent action would be affected; interpersonal relations would probably be affected by inappropriate action or reaction.

Relationships between dogmatism and critical thinking skills, social class, values, and academic achievement, pre-decisional information search, principal's ratings of teachers, and other factors have been reported.³⁸ Conclusions from these studies are useful

³⁸ C. Gratton Kemp, "Improvement of Critical Thinking in Relation to Open-Closed Belief Systems," Journal of Experimental Education, XXXI (March, 1963), 321-323.
 I. J. Lehmann, "Some Socio-Cultural Differences in Attitudes and Values," Journal of Educational Sociology, XXXVI (September, 1962), 1-9. R. M. Frumkin, "Dogmatism, Social Class, Values, and Academic Achievement in Sociology," Journal of Educational Sociology, XXXIV (May, 1961), 398-403. Barbara H. Long, and Robert C. Ziller, "Dogmatism and Predecisional Information Search," Journal of Applied Psychology, XLIX (October, 1965), 376-378. D. Musella, "Open-Closed-Mindedness as Related to the Ratings of Teachers by Elementary School Principals," Journal of Experimental Education, XXXV (Spring, 1967), 75-79.
 John T. Mouw, "Effect of Dogmatism on Levels of Cognitive Processes," Journal of Educational Psychology, LX (October, 1969), 365-369.

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for generating hypotheses about teacher behaviors. However, only reported research on the dogmatism of teachers will be reviewed here.

Rabkin tested Soderbergh's assumption that public school teachers in America are excessively and unwittingly dogmatic.³⁹ One hundred seven teachers registered for summer school at the University of Washington responded to the Rokeach Dogmatism Scale. The teachers were more open-minded than any of the norm groups of Rokeach. Age, sex, years of experience, religious affiliation, grades taught, and marital status were not significantly related to dogmatism. Teachers in this biased sample exhibited a considerably lower degree of rigid thinking when compared with other college and non-college groups.⁴⁰

In a similar study, Cappelluzzo and Brine administered the Dogmatism Scale and a brief questionnaire to 254 undergraduates in education. The respondents (prospective teachers) were neither more nor less dogmatic than state

³⁹ P. A. Soderbergh, "Dogmatism and the Public School Teacher," Journal of Teacher Education, XV (September, 1964), 245-251.

⁴⁰ Leslie Y. Rabkin, "The Dogmatism of Teachers?," Journal of Teacher Education, XVII (Spring, 1966), 47-49.

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university students in general. They were more dogmatic than the in-service teachers measured by Rabkin. Students with various subject matter interests portrayed different levels of dogmatism.⁴¹

Ohnmacht administered Ryans' Teacher Characteristics Schedule, the California F-Scale, the Dogmatism Scale, and measures of analytic set to fifty-seven male secondary education majors. The scores were intercorrelated and the matrix factor analyzed. Subjects were grouped on analytic set and dogmatism. Low analytic-high dogmatic individuals differed significantly from other subjects in their tendency to give information. Results suggested that open-mindedness and analytic set could contribute to an understanding of teacher behavior if their effects as moderating variables were investigated.⁴²

Results of studies on authoritarianism and perceptual accuracy provide evidence that the perceiver's own character will affect the manner in which he perceives

⁴¹ Emma M. Cappelluzzo and James Brine, "Dogmatism and Prospective Teachers," Journal of Teacher Education, XX (Summer, 1969), 148-152.

⁴² F. W. Ohnmacht, "Teacher Characteristics and Their Relationship to Some Cognitive Styles," Journal of Educational Research, LX (January, 1967), 201-204.

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others.⁴³ Brumbaugh and his colleagues investigated the relationship between dogmatism of student teachers and supervising teachers and their perceptions of the interpersonal needs of each other. Forty secondary school teachers and their public school supervising teachers completed the Dogmatism Scale and Schutz' FIRO-B Scale (used to measure interpersonal needs). The measure of perceptual accuracy in estimating interpersonal needs consisted of an index of difference between the total score on each dimension registered by the target person on the FIRO-B protocol and the dimension score predicted for that person by the subject. Results indicated that open-minded student teachers were no more accurate in their perceptions of the interpersonal needs of supervising teachers than were closed-minded student teachers. Nor were open-minded supervising teachers any more accurate in their perceptions of the interpersonal needs of student teachers. Chi-square analysis was used to compare subject matter areas to level of dogmatism. Mathematics, science, and social studies teachers were

⁴³ Paul F. Secord and Carl W. Backman, Social Psychology (New York: McGraw-Hill Book Company, 1964), 80.

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found to be significantly more closed-minded than teachers in areas of foreign language, English, or the fine arts.⁴⁴

Johnson investigated the relationship between open-closed mindedness of student teachers and ratings of their student teaching made by cooperating teachers and college supervisors. Supervising teachers tended to give higher ratings to student teachers who were closed-minded. Ratings by college supervisors and the dogmatism scores of student teachers were not significantly related. The similarity of open- and closed-mindedness of student teachers and their cooperating teachers had little effect on the ratings of success in student teaching, but a significant number of student teachers changed in dogmatism score in the direction of their cooperating teacher. Low dogmatic student teachers expressed more favorable attitudes on the MTAI. Student teachers' own ratings of success in practice teaching were not related to their level of dogmatism. The degree of open-closed-mindedness as indicated by scores on the Dogmatism Scale could not be used to predict success in student teaching if ratings of college

⁴⁴R. B. Brumbaugh, Kenneth C. Hoedt, and William H. Beisel, Jr., "Teacher Dogmatism and Perceptual Accuracy," Journal of Teacher Education, XVII (Fall, 1966), 332-335.

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supervisors and cooperating teachers were used as the criterion, Johnson concluded.⁴⁵ These conclusions must be accepted with caution, though. Attrition among the subjects was considerable, and differential characteristics of the groups were not reported.

Lewis examined the relationship between open- and closed-mindedness of teachers and perceived effectiveness of teaching (self-rating, principals' ratings, and supervisors' ratings). One hundred twelve junior and senior high school teachers participated in the study. In general, the level of dogmatism of a teacher was not related to self-rating of teacher effectiveness. Principals and supervisors tended to give higher ratings of teacher effectiveness to more dogmatic teachers. Lewis suggested that dogmatism may have limited usefulness in identifying effective teachers.⁴⁶ Perhaps not only dogmatism but ratings of effectiveness should be called into question.

⁴⁵James Johnson, "The Relationship of Open- and Closed-Mindedness to Success in Student Teaching" (unpublished Ed.D. dissertation, George Peabody College for Teachers, 1966), 125 pages.

⁴⁶Franklin Garner Lewis, "The Relationship of Authoritarianism as Revealed by the Rokeach Dogmatism Scale and Perceived Effectiveness of Teaching as Indicated by Teachers' Self-Ratings, Principals' Ratings and

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Piele investigated the relationship of teacher dogmatism to verbalizations in the classroom under actual teaching conditions. Seventy teachers from elementary and junior high schools in the Northwestern part of the United States completed the Dogmatism Scale. Seventeen teachers from the upper and lower quartiles of the score distribution were selected for further study. These thirty-four teachers tape-recorded six twenty-minute segments of regular class lessons. Observers trained in the use of Flanders' system of interaction analysis recorded the verbal behaviors. Open and closed-minded teachers appeared to differ significantly (a) in their monopolization of talk in the classroom and (b) in their use of a variety of verbal behaviors. Children in the classroom appeared to differ (a) in their use of student-to-student interaction, and (b) in their use of student-to-student interaction with silence or confusion following. Piele related his findings to Hanny's study of the relationship

Supervisors' Ratings" (unpublished Ed.D. dissertation, North Texas State University, 1968), 90 pages, Dissertation Abstracts, XXIX (December, 1968), 1682 A.

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between level of dogmatism and teaching in a simulated situation. Closed-minded teachers appeared to use a wider variety of verbal behaviors and to monopolize talk in the classroom more under actual teaching conditions than did teachers in simulated conditions. Under simulated teaching conditions, open-minded teachers tended to use indirect influence more than did teachers in the normal classroom. Under both simulated and actual teaching conditions, students of open-minded teachers seemed to talk more than students of closed-minded teachers. Piele advanced some plausible explanations for these results. Closed-minded teachers may be more concerned about classroom control, and try to discourage student talk by monopolizing classroom talk. In so doing, they use a variety of verbal behaviors, and obtain a higher score for indirect influence.⁴⁷

⁴⁷ Philip Kern Piele, "The Relationship of Teacher Open and Closed Mindedness to Classroom Verbal Behavior" (unpublished Ph.D. dissertation, University of Oregon, 1968), 88 pages, Dissertation Abstracts, XXIX (May, 1969), 3899-3880 A.

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Summary

Despite the fact that many studies occurred in a field setting and that intervening variables could easily contaminate the work, results show that teacher personality factors, when studied individually or in conjunction with other factors, do relate to teaching behaviors. Attitudes, needs, and beliefs of a teacher integrate within his unique personality. They influence one another, and are affected by the press of environmental conditions. In a sense, it is artificial to separate them, as Gordon indicated.⁴⁸ Figure 2.1 portrays schematically the dynamic relationships between these constructs within a person and environmental forces acting upon the individual.

⁴⁸Gordon, "Relationships Between Personality Variables and Classroom Behavior of Teaching Interns," 8-9.

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U = Environment

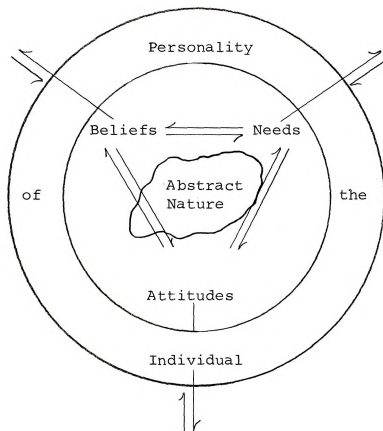


Fig. 2.1.--Interrelationships Between Attitudes, Needs, and Beliefs Within the Personality, and the Press of Internal and External Forces on the Personality.

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Observation of Overt Classroom Behaviors

Observation of overt behaviors in the classroom seems an obvious means of obtaining information regarding what does occur in teaching. However, use of systematic observations is beset with difficulties. Much time and expense can be expended to little avail. The privacy of teachers is invaded. The presence of an observer causes behaviors to be atypical. Past studies utilizing observation of overt classroom behaviors have contributed little to our knowledge of "effective teaching." These and other objections are raised when systematic observation of the teaching-learning process is advocated.⁴⁹

Despite these objections, numerous category systems for recording classroom behaviors of teachers and pupils have been developed.⁵⁰ These systems can be classified into three major categories: affectively oriented systems, cognitively oriented systems, and multi-dimensional systems. In the affective systems, such as

⁴⁹ Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 247-248.

⁵⁰ Anita Simon and E. Gil Boyer, ed., Mirrors for Behavior (Philadelphia: Research for Better Schools, Inc., Classroom Interaction Newsletter, January, 1968).

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Withall's and Flanders', dimensions of teaching related to teacher-pupil interactive behaviors are considered. Cognitive systems of Taba, Smith, and Bellack attend to behaviors that shape habits of thinking, or methods of acquiring information and skills. Both affective and cognitive dimensions of behavior are considered in comprehensive systems such as Medley and Mitzel's Observation Schedule and Record. Selection of a particular system depends on the purpose for which the instrument is being employed.⁵¹

Systematic observations of classroom behaviors may be used to obtain reliable and valid measurements of differences in the typical behaviors which occur in different classrooms, or in different situations in the same classroom. A measure is reliable if the average difference between independent measurements obtained in the same classroom is smaller than the average difference between two measurements obtained in different classrooms. If behaviors in a particular class are stable, observers agree on what does occur, items in the category system

⁵¹B. Othanel Smith, "Recent Research on Teaching: An Interpretation," The High School Journal, LI (November, 1967), 63-65.

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are consistent, and differences between different classes are large, reliability will be high. Valid measurement requires differences in scores to reflect differences in behaviors. Three conditions must be fulfilled; (1) a representative sample of the behaviors to be measured must be observed; (2) an accurate record of the observed behaviors must be obtained; and (3) the records must be scored so as to faithfully reflect differences in behavior.⁵²

Reliability is a tricky concept. Though consistency of measurement is the commonly accepted meaning, many types of consistency can be measured. Behaviors of an individual may be the same (consistent) under repeated observations. Or, the individual may retain the same relative position in a group of individuals. Again, the percent of observer agreement or correlation between two sets of observations may be reported. In any case, reliability coefficients are meaningless without some differentiation and definition.⁵³ Brown and others aptly

⁵² Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 250.

⁵³ Bob Burton Brown, William Mendenhall, and Robert Beaver, "The Reliability of Observations of Teachers' Classroom Behavior," The Journal of Experimental Education, XXXVI (Spring, 1968), 3-4.

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demonstrated the necessity of defining reliability in their study of the Teacher Practices Observation Record (TPOR). This instrument was developed for field use by "untrained" observers. Five filmed episodes of teacher-behaviors were observed by a large number of observer judges in different sections of the country. After a year, two of the films were rated a second time. The authors found that:

1. Correlations of observers' total scores within a given film viewing was very good.
2. Correlations of observers' scores between film viewings one year apart was poor to fair.
3. Between-observer reliability was .57 or rated fair.
4. Within-observer reliabilities ranging from .48 to .62 were rated fair.
5. Internal consistency reliability was rated good.⁵⁴

⁵⁴Ibid., 8.

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In selecting an observation schedule, attention should be given to the reliability of the instrument. Very few researchers report more than one reliability coefficient; some do not even define the meaning of the coefficient that is reported. It is easy to see that the highest reliability coefficient could be selected and reported.

Several studies already cited in this review employed classroom observations by trained observers as criterion measures. One of many objections raised regarding systematic observation of overt behaviors is the effect of the observer in the classroom.

The objection that teachers and pupils may not behave in exactly the same way when observers are present as they behave when no observer is present has no completely satisfactory answer. The problem of comparing observed and unobserved behavior is akin to that of the small boy who turned out the bedroom light but could never quite make it to his bed before the room got dark. To know how teachers and pupils behave while they are under observation seems better than to know nothing at all about how teachers and pupils behave.⁵⁵

Usually, experimenters assume that observer effects are negligible and use all the data collected. Or,

⁵⁵Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 248.

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they assume that observer effects diminish over time, discard the first few minutes of observations, and use the remaining data. Again, the observer may spend many hours in the classroom so that both teacher and students become accustomed to his presence, resume "normal" activity, and thus present "true" behaviors when recording is initiated.

But this does not solve the dilemma, for observed and unobserved behaviors must be compared to estimate observer effects. No such study has been reported, it seems. However, Masling and Stern hypothesized that, if observer bias diminishes over time, the relationship between the first and final observations should be less than the relationship between the second and final observations, and any other such pairing of intermediate and final observations. Seven trained observers rated teachers and pupils in twenty-three classrooms. Correlations showed no consistent pattern of increase or decrease over time. The fact may be that teacher and pupil variables under observation occur episodically and are more important than observer influence. Or, the effects

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of the observer may be extremely complex and affect various aspects of classroom behavior differentially.⁵⁶

Though his sample consisted of only ten female teachers, Samph found a definite observer effect when subjects were observed under four experimental conditions. Teachers became more "indirect" when an observer was present in their classroom whether or not they were informed prior to his coming. They used more "praise," "acceptance of student ideas," and less "criticism" when being observed. Samph concluded that the presence of an observer in the classroom leads to change in a teacher's verbal behaviors.⁵⁷

Summary

Some research related to the present study of congruency between self-identified attitudes, needs, and beliefs and overt classroom behaviors has been reported.

⁵⁶ Joseph Masling and George Stern, "Effect of the observer in the Classroom," Journal of Educational Psychology, LX (October, 1969), 351-354.

⁵⁷ Thomas Samph, "Observer Effects on Teacher Behavior" (unpublished Ph.D. dissertation, University of Michigan, 1968), Dissertation Abstracts, XXIX (February, 1969), 2573 A.

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The review of literature is far from exhaustive, and while support is given to congruency between personality and overt behaviors in some instances, contradictory results are also evident.

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CHAPTER III

PROCEDURES UTILIZED IN THE INVESTIGATION

Introduction

This chapter provides a detailed description of the procedures followed in this investigation. First of all, a summary of salient characteristics of the study sample is given. Secondly, the instruments used in collecting data are described. Finally, the stages of the analysis are summarized, the statistical techniques are discussed and reasons for their use explained.

Selection of the Study Population

The subjects selected for this study were intern teachers enrolled in the Michigan State University Elementary Intern Program, Spring Term, 1969. This population was chosen for several reasons. Faculty members associated with the intern program were interested in continued research and willing to cooperate in the

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endeavor. Furthermore, the subjects were beginning teachers; that is, they were completing their first full year of teaching in the elementary school. One hundred seventy-eight out of a total of 191 interns participated in the study.

The target population of the investigation included all elementary education students who participate in a year of internship teaching prior to receiving their bachelor's degree and provisional teacher certification. Participants in the Elementary Intern Program at Michigan State University represented a sample of this population. Furthermore, the 1968-1969 graduates of EIP constituted a sample of past and future Elementary Intern Program participants. Since subjects included in this investigation were considered a sample of a larger population, pertinent characteristics were gathered to guide interpretation of the results of the present study.

Description of the Study Sample

One hundred ninety-one intern teachers were enrolled in the Elementary Intern Program during 1968-1969,

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and were completing their teaching internship in public schools of southern Michigan. This figure represents 89.67% of the original 213 sophomores (176 females and 37 males) electing this teacher preparation program in 1967. Not all EIP participants were included in the study sample. Due to ill health of four interns, consultants were not able to complete the classroom observations. In another instance, observation schedules were incorrectly completed and resulted in the loss of six subjects. One intern was disturbed by recorded observations of her teaching; hence, visits to her classroom were discontinued. Two interns entered the program after the personal information and personality data were gathered. These interns could not be numbered in the study sample. Thus the final sample of this investigation included 37 male (17.42%) and 146 female (82.58%) elementary intern teachers.

Teaching Assignments

During the 1968-1969 academic year, each intern taught in a public school district of Michigan affiliated with the Elementary Intern Program. Table 3.1 summarizes

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the teaching assignments of the 178 intern teachers for whom both personality assessments and records of overt classroom behaviors were available.

Table 3.1.--Sex and Teaching Assignment of 178 Intern Teachers in the Elementary Intern Program, 1968-1969.

Teaching Assignment	Sex				Total Sample	
	Male		Female			
	Number	Percent	Number	Percent	Number	Percent
Grades K-2	1	3.23	71	48.30	72	40.45
Grades 3-5	13	41.94	56	38.10	69	38.76
Grades 6-8	14	45.16	13	8.84	27	15.17
Special Education	3	9.67	7	4.76	10	5.62
Total	31	100.00	147	100.00	178	100.00

Most male subjects accepted teaching assignments in middle and upper middle elementary grades (87.10%) while more female subjects taught in lower and middle grades (86.40%).

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Age Characteristics

The age range of these beginning teachers spans more than thirty years. This is not unusual for the Elementary Intern Program. Since its inception, a number of older married or widowed women enrolled in EIP along with younger female and male candidates.¹ The median age in this sample of first year teachers was twenty-two years. Table 3.2 indicates the age distribution of the intern teachers included in the sample.

Table 3.2.--Distribution of 178 Intern Teachers by Age.

Subjects	Age Groups							No Response
	21-25	26-30	31-35	36-40	41-45	46-50	50+	
Number	131	7	11	12	7	2	2	6
Percent	73.60	3.93	6.18	6.74	3.93	1.12	1.12	3.37

Almost three-fourths of the interns were in the age category, 21-25, which is typical for students who have

¹ Bernard R. Corman and Ann G. Olmsted, The Internship in the Preparation of Elementary School Teachers (East Lansing, Michigan: College of Education, Michigan State University, 1964), 21.

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continued their college education immediately after high school graduation. About six percent of the interns were more than forty years old at the time of their first teaching assignment.

Individuals vary in the time that they are inclined toward a profession and the time of actual commitment to a profession. Most of the subjects included in this study were drawn to the pedagogic profession during high school and committed themselves to teaching during college as Table 3.3 portrays.

Table 3.3.--Age at the Time of Orientation Toward and Commitment to Teaching for the 178 Intern Teachers.

Age Grouping	Orientation		Commitment	
	Number	Percent	Number	Percent
Prior to fourteen	61	34.27	9	5.06
Between fourteen and eighteen	67	37.64	58	32.59
After entry to college	45	25.28	107	60.11
No response	5	2.81	4	2.25
Total	178	100.00	178	100.01

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Educational Background

In Table 3.4, the type of elementary and secondary schooling for each intern is indicated. The greatest proportion of subjects attended public schools at both levels. However, twenty-one percent of the subjects reported receiving some education in private schools at the elementary level and twelve percent reported receiving some education in private schools at the secondary level.

Table 3.4.--Type of School Attended by Intern Teachers during Their Elementary and High School Years.

Type of School	Level			
	Elementary		Secondary	
	Number	Percent	Number	Percent
Public	135	75.84	151	84.83
Parochial or private	20	11.24	20	11.24
Both public and parochial or private	18	10.11	2	1.12
No response	5	2.81	5	2.81
Total	178	100.00	178	100.00

Sophomore students from community colleges may elect the Elementary Intern teacher education program.

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One hundred thirty-seven of the 178 subjects in the sample were admitted to EIP from colleges other than Michigan State University. Table 3.5 details the college background of the intern teachers up to the time of their admission to EIP.

Table 3.5.--College Background of 178 Intern Teachers Prior to Admission to the Elementary Intern Program.

College Education	Number	Percent
Only at Michigan State University	37	20.79
Up to one year at another college	6	3.37
One to two years at another college	87	48.88
Two or more years at another college	44	24.72
No response	4	2.25
Total	178	100.01

Only one intern in five had completed all his education at Michigan State University. The remainder had attended another college for at least part of their education, and four had received two or more years training in another institution.

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Michigan State University College of Education requires a cumulative grade point average of 2.00 to qualify for student teaching. Eighty-eight percent of the intern teachers reported a grade point average equal to or exceeding that minimal requirement at the time of entry to EIP in 1967. Table 3.6 summarizes the statistics on grade point average reported by the 178 intern teachers at the time of entry to the intern program.

Table 3.6.--Grade Point Average Reported by Intern Teachers at Entry to the Elementary Intern Program, 1967.

Grade Point Average	Number	Percent
Less than 2.00	11	6.18
2.00 - 2.49	64	35.96
2.50 - 2.99	56	31.46
3.00 - 3.49	31	17.42
3.50 - 4.00	6	3.37
No response	10	5.62
Total	178	100.01

Over half the sample reported a grade point average exceeding 2.50. Just six percent of the subjects did not

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meet the minimal g.p.a. requirement for student teaching before taking their methods courses.

Community Background

Approximately one-fourth (24.16%) of the interns reported that they resided in a city having 10,000 to 100,000 people. More than thirty-three percent of the interns said they lived in a suburban metropolitan area of a city of 100,000 to 500,000 people. Table 3.7 provides a complete description of community background for the 178 intern teachers included in the study sample.

Table 3.7.--Type of Community Background Reported by 178 Intern Teachers, 1968-1969.

Type of Community	Number	Percent
Metropolitan city: over 500,000 people	20	11.24
Suburban community near metropolitan center	31	17.42
City: 100,000-500,000 people	29	16.29
Suburban community near a city	9	5.06
City of 10,000 to 100,000 people	43	24.16
City of 2,500 to 10,000 people	25	14.04
Rural community of less than 2,500 people or a farm	17	9.55
No response	4	2.25
Total	178	100.01

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Instrumentation

Several standardized measurement devices were used in this research: The Minnesota Teacher Attitude Inventory, Edwards Personal Preference Schedule, the Rokeach dogmatism Scale (short form), and the Observation Schedule and Record (OSCAR). The purpose, validity, and reliability of measurement for each instrument is summarized in this section.

The Minnesota Teacher Attitude Inventory

The Minnesota Teacher Attitude Inventory (MTAI) was developed by Cook, Leeds, and Callis to assess teacher attitudes which would predict the type of teacher-pupil relations a teacher would maintain in the classroom.² Cook originated the work in his doctoral research devoted to the development of the Teacher-Pupil Inventory.³ He

²Walter W. Cook, Carroll H. Leeds, and Robert Callis, Minnesota Teacher Attitude Inventory: Manual (New York: The Psychological Corporation, 1951).

³Carroll H. Leeds, "The Construction and Differential Value of a Scale for Determining Teacher-Pupil Attitudes" (unpublished doctoral dissertation, University of Minnesota, Minneapolis, Minnesota, 1946).

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first identified desirable and undesirable characteristics of teacher-pupil relations. These extreme categories guided Leeds in selecting items regarding: (1) the moral status of children; (2) discipline in the school and methods of dealing with discipline problems; (3) principles of child development and behavior; (4) principles of education related to philosophy, curriculum, and administration; and (5) personal likes and dislikes of the teacher.⁴

The revised version of the attitude inventory contains 150 statements to which the subject responds on a five-category Likert-type scale ranging from strongly agree to strongly disagree. Though the responses of an individual are considered neither right nor wrong, a scoring key using the common labels is provided. The highest possible score is +150 and the lowest is -150. Teachers who rank high are assumed to have the ability to maintain a more harmonious relationship with children, to be more permissive, to create a cooperative learning environment, and to have fewer disciplinary problems.

⁴Cook, Leeds, and Callis, Minnesota Teacher Attitude Inventory: Manual, 10.

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Low scoring subjects are thought to be strict disciplinarians, content-oriented rather than child-centered and less open to a variety of approaches to problem-solving.⁵ The MTAI was devised to discriminate sharply between teachers who maintain extremes in their rapport with children.⁶

Leeds correlated MTAI scores of one hundred teachers with ratings by principals, an expert, and pupils. Each respective rating correlated .46, .59, and .31 with the Minnesota Teacher Attitude Inventory score. Using combined multiple weights for the three validating criteria, an overall .63 correlation was obtained.⁷ Thus, the MTAI seemed to have some predictive power regarding teacher-pupil rapport when compared with ratings by principals, pupils, or an expert. However, it appeared that

⁵Robert G. Oana, "An Analysis of the Use of the Minnesota Teacher Attitude Inventory in a Preservice Program in Childhood Education" (unpublished Ed.D. dissertation, Columbia University, 1965), 32-33.

⁶Cook, Leeds, and Callis, Minnesota Teacher Attitude Inventory: Manual, 4.

⁷Carroll H. Leeds, "A Second Validity Study of the Minnesota Teacher Attitude Inventory," Elementary School Journal, LII (March, 1952), 396-405.

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judging by an expert was a better predictor than either of the other ratings.

Using very similar procedures with a slightly modified version of the inventory, Callis correlated MTAI and ratings scores of seventy-seven teachers. Correlation between principals' ratings and MTAI scores ($r = .19$) was much lower than that found in Leeds' sample ($r = .46$). Ratings by two experts correlated .40 with the MTAI scores compared to .59 for Leeds' ratings of teachers in his sample). On the other hand, Callis reported a much higher correlation between pupils' ratings of their teachers and the MTAI score of those teachers than did Leeds (for Callis' sample, $r = .49$; for Leeds' sample, $r = .31$).⁸ Whether the ratings method of gathering evidence of validity is unstable, or the instrument itself has low validity.

In his factorial study of the Minnesota Teacher Attitude Inventory, Ferguson reported that only one type

⁸Robert Callis, "The Efficiency of the Minnesota Teacher Attitude Inventory for Predicting Interpersonal Relations in the Classroom," Journal of Applied Psychology, XXXVII (April, 1953), 82-85.

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of attitude is measured by the MTAI.⁹ Considering the number of items and the five sources from which they were drawn, this is rather surprising. It justifies the use of the total MTAI score as a variable in itself rather than considering responses to subsets of items in the inventory, however.

Studies of the consistency of measurement over time seem to indicate that respondents' attitudes shift toward "a more realistic view" as students complete their student teaching. Day found that average scores for student teachers showed a mean loss of four points in that brief period of time. Test-retest differences for seniors who entered teaching showed an average loss of twenty points after a six-month period. Non-teacher graduates, however, only lost an average of one and one-half points over the same period of time.¹⁰ Oana reported an increase in mean MTAI score for sixty-four participants in student

⁹ John L. Ferguson, Jr., "A Factorial Study of the Minnesota Teacher Attitude Inventory" (unpublished Ed.D. dissertation, University of Missouri, 1953), Dissertation Abstracts, XIII (No. 6, 1953), 1087.

¹⁰ Harry P. Day, "Attitude Changes of Beginning Teachers After Initial Teaching Experience," Journal of Teacher Education, X (September, 1959), 326-328.

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teaching. However, the gains were largely negated by a definite drop in scores after one or two years of teaching experience.¹¹

The Edward Personal Preference Schedule

Murray's taxonomy of needs was briefly reviewed in Chapter II. It seemed appropriate to base the discussion of personal manifest needs on Murray's theory since Edwards studied with Murray. Edwards extended the work of Murray by defining the manner in which each inner need would manifest itself in the overt behavior of an individual. He then constructed an inventory to assess these manifest needs.

The Edwards Personal Preference Schedule (EPPS) is a 225-item ipsative measuring device designed to provide within individual comparisons of the relative strength of fifteen "manifest needs": (1) Achievement; (2) Deference; (3) Order; (4) Exhibition; (5) Autonomy; (6) Affiliation;

¹¹ Oana, "An Analysis of the Use of the Minnesota Teacher Attitude Inventory in a Preservice Program in Childhood Education."

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(7) Intraception; (8) Succorance; (9) Dominance; (10) Abasement; (11) Nurturance; (12) Change; (13) Endurance; (14) Heterosexuality; (15) Aggression.¹² Edwards reported that split half internal consistency reliability coefficients ranged from .60 to .87 with a median of .78. One-week retest reliability coefficients ranged from .70 to .87 with a median reliability of .83.¹³

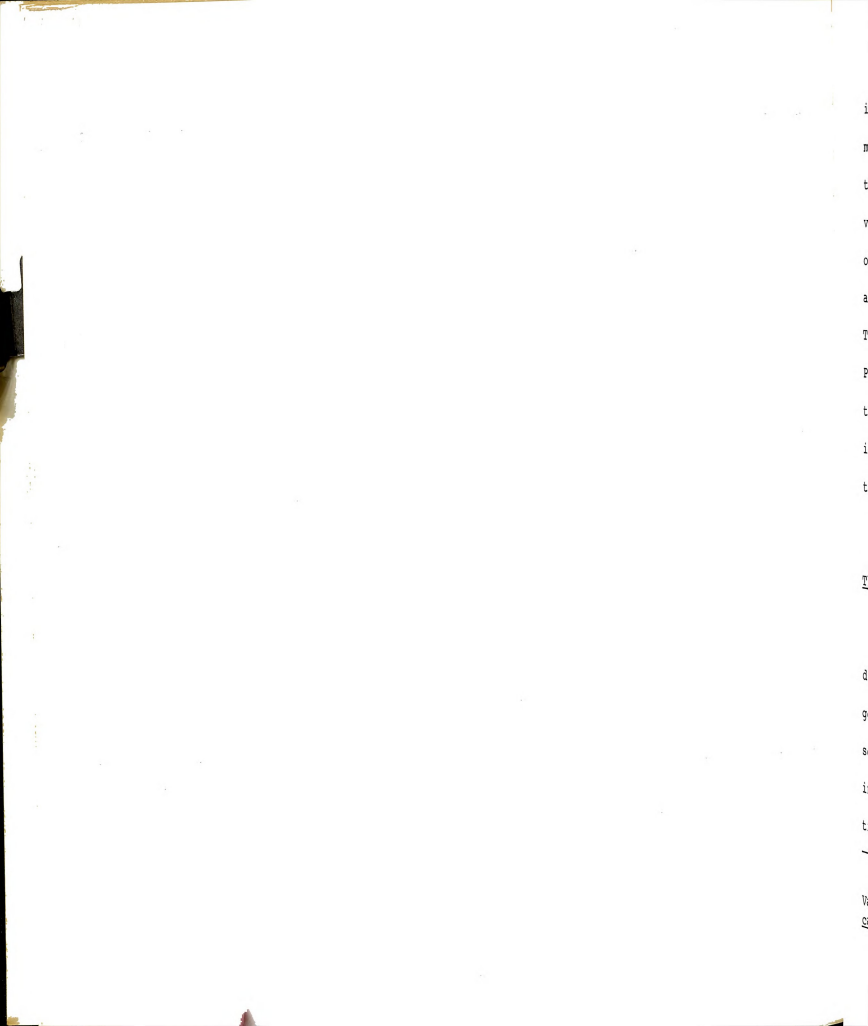
Early norms for the EPPS were based on responses of 1,509 liberal arts students. In the revised version of the EPPS, extensive adult norms were also provided. Teachers' needs profiles compared more favorably with college educated adults of the same age than with liberal arts students' profiles.¹⁴

In order to assess the extent to which three instruments validly measure the fifteen needs mentioned above, Poe intercorrelated the fifteen needs across the

¹²A. L. Edwards, Edwards Personal Preference Schedule: Manual (Rev. Ed., New York: The Psychological Corporation, 1959). The fifteen need variables are described in Appendix A.

¹³Ibid., p. 19.

¹⁴Getzels and Jackson, "The Teacher's Personality and Characteristics," 546.



inventories (one of which was the EPPS). A multitrait-multimethod matrix was constructed from these correlations. All correlations met the criterion for convergent validity; that is, the correlation of different measures of the same trait were significantly different from zero and sufficiently large to warrant further exploration. The criterion for discriminant validation was also met. Poe concluded that each of the three methods measured the needs and that the fifteen needs were meaningful variables which may be related to other factors of interest to educational researchers.¹⁵

The Dogmatism Scale

The Rokeach Dogmatism Scale measures individual differences in openness or closedness of belief systems, general authoritarianism, and general tolerance. Items selected for the scale are familiar to the average person in everyday life, and transcend specific ideological positions. Form E, the most widely used version, consists of

¹⁵Charles A. Poe, "Convergent and Discriminant Validation of Measures of Personal Needs," Journal of Educational Measurement, LXI (Summer, 1969), 103-107.

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forty statements to which the respondent indicates the relative strength of his agreement (+1 to +3) or disagreement (-1 to -3). For all statements, agreement is scored as closed and disagreement as open. Thus, the higher the score, the more dogmatic an individual is said to be. The total score on the Dogmatism Scale is the sum of scores obtained on all items.¹⁶ Rokeach reported reliabilities ranging from .68 to .93 for the forty-item scale.¹⁷

Length of measuring devices consistently poses a problem for researchers who must collect data in field situations. Troldahl and Powell, to solve this problem regarding the Dogmatism Scale, administered the forty-item test to two samples of adult subjects from which a split-half reliability coefficient of .84 was obtained. Respondents' scores on each item were correlated with their total score to obtain a homogeneity index for each item. Several short forms of the scale were constructed using the items having the highest item-total score correlation. Scores on each short form were then correlated with dogmatism scores on the complete scale. The twenty-item

¹⁶Rokeach, The Open and Closed Mind, 71-73.

¹⁷Ibid., 90.

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version (just half as long as the original Dogmatism Scale) correlated .95 and .94 for the Boston and Lansing samples respectively. According to these figures, the twenty-item short form is a good predictor of what a respondent would obtain on Form E.¹⁸ The twenty-item version was administered in this study.¹⁹

Jay questioned Rokeach's assumption of the unitary basis for the belief-disbelief system. He analyzed the response patterns of twenty-nine college subjects by means of Q-technique factor analysis and rotated three factors to simple structure. Three factors described the students: (1) open-minded, tolerant, nondogmatists; (2) true believers who have a profound and generalized fear of life; and (3) true believers who are authoritarian.²⁰ Each factor found by Jay seems to correspond with

¹⁸Verling C. Troidahl and Fredric A. Powell, "A Short-Form Dogmatism Scale for Use in Field Studies," Social Forces, XLIX (December, 1965), 211-214.

¹⁹The twenty-item scale is reproduced in Appendix B.

²⁰Rutledge L. Jay, "Q-Technique Factor Analysis of the Rokeach Dogmatism Scale," Educational and Psychological Measurement, XXIX (Summer, 1969), 453-459.

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a particular dimension of Rokeach's definition of dogmatism, however.²¹

From their investigation of the scoring methods and construct validity of the Dogmatism Scale, Korn and Giddan concluded that response set may occur in an individual's manner of response to the statements.²² This is not an unusual phenomenon, though, and may in itself be an indication of the person's open-closed-mindedness.

The Observation Schedule and Record

In addition to the three inventories used to obtain indirect evidence of attitudes, beliefs, and needs of intern teachers, a standardized instrument was employed to record overt behaviors of intern teachers in their elementary school classrooms. Medley and Mitzel developed the observation form, OSAR (Observation Schedule and

²¹Rokeach, "The Nature and Meaning of Dogmatism," 94.

²²Harold A. Korn and Norman S. Giddan, "Scoring Methods and Construct Validity of the Dogmatism Scale," Educational and Psychological Measurement, XXIV (Winter, 1964), 867-874.

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record), for use in a follow-up study of teacher education graduates. By modifying and combining items constructed by Cornell, Lindvall, and Saupe,²³ and Withall²⁴ the authors (1) increased observer accuracy by reducing the difficulty of judgments on the part of the observer; (2) employed but one observer per classroom; and (3) separated the process of observing from the process of scoring. The observer merely checked a behavior which occurred without judging its possible significance.

Items related to teacher-pupil relations, independent teacher and pupil activities, affective behaviors, grouping arrangements, materials used and subject matter observed were recorded in a five-minute observation period. In the second five minutes the observer attended verbal behaviors of the teacher. The observer altered observation of general class activities with verbal behaviors for a thirty-minute period.

²³ F. G. Cornell, C. M. Lindvall, and J. L. Saupe, Exploratory Measurement of Individualities of Schools Classrooms (Urbana: Bureau of Educational Research, University of Illinois, 1952).

²⁴ John Withall, "Development of a Technique for Measurement of Socio-Emotional Climate in Classrooms," Journal of Experimental Education, XVII (March, 1949), 361.

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Data collected in the original study of forty-nine beginning teachers were analyzed in several steps. First, items were combined into twenty "keys" and scored. Mean scores on each key were studied to explore possible reliable differences for the forty-nine classrooms; six keys were discarded as unreliable. A factor analysis of the remaining fourteen keys revealed three dimensions corresponding to the first three rotated factors: Emotional Climate, Verbal Emphasis, and Social Structure. Emotional Climate referred to the amount of hostility observable in the classroom. A high score indicated external manifestation of warmth and friendliness with rare occasions of hostile reactions. Verbal Emphasis indicated the degree to which such verbal activities as reading, writing, or discussion of the textbook predominated. Social Structure referred to the amount of pupil autonomy as opposed to structured group activities. High scores on this dimension indicated that the class functioned quite autonomously with little teacher talk.

Reliability coefficients estimated the correlation between the mean of all the scores assigned to the teachers by the six observers in twelve observation

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periods and means of scores that would be assigned to the same teachers by six different observers visiting each teacher at twelve different times. Table 3.8 shows the reliability and the intercorrelations between each of the three dimensions described above.²⁵

Table 3.8.--Intercorrelations Among Three Factor Scales Based on OSCAR Scores of Forty-Nine Beginning Teachers.*

Scale	EC	VE	SS
Emotional Climate (EC)	(.903)	-.004	-.110
Verbal Emphasis (VE)		(.770)	+.028
Social Structure (SS)			(.826)

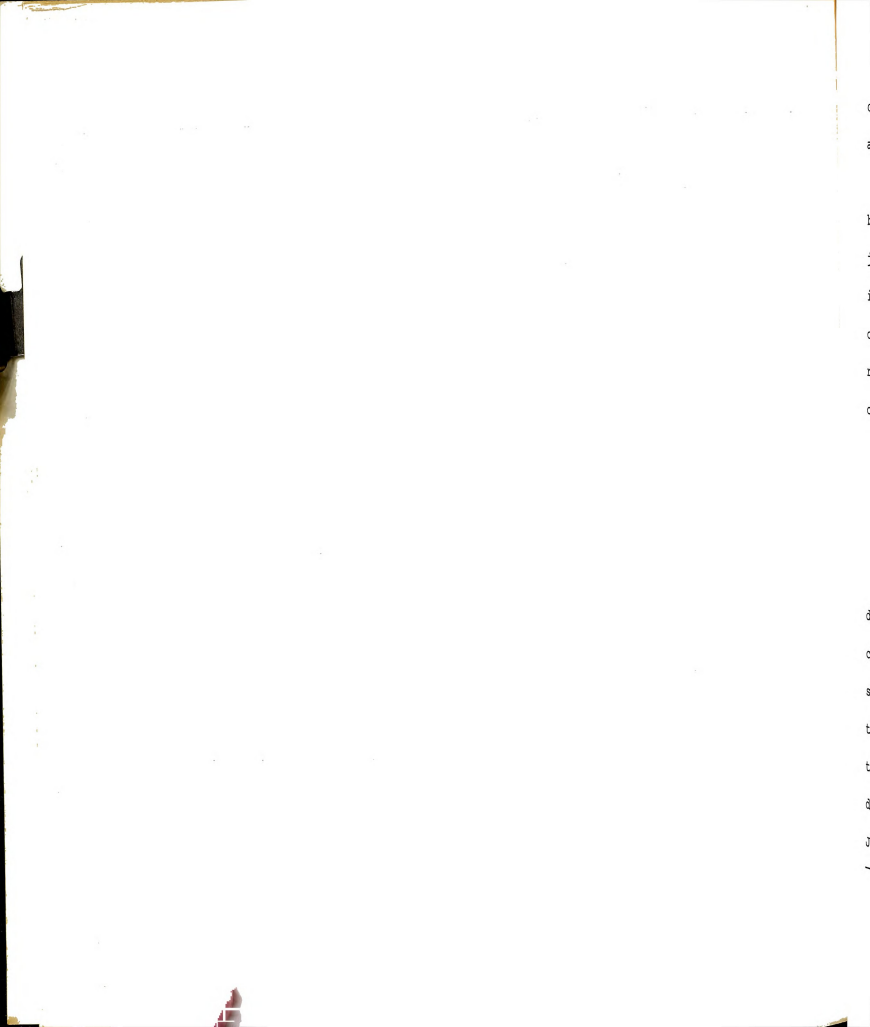
Reliabilities are reported in the diagonal.

Practically every category of OSCAR was used in this research.²⁶ Medley's recent revision of the verbal section

or K-scale (now called OSCAR 5V) was not used since

²⁵Donald M. Medley and Harold E. Mitzel, "A Technique for Measuring Classroom Behavior," Journal of Educational Psychology, XLIX (April, 1958), 90.

²⁶Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 278-280, provides a copy of SCAR 2a. A sample observation form and description of the categories used in this investigation appears in Appendix C.



observers could not be sufficiently trained in the time available for that phase of the study.

OSCAR III does not probe aspects of classroom behavior related to pupil achievement of cognitive objectives. The dimensions that it does measure probably indicate the most obvious differences among elementary classes. Reliable measurement of obvious differences is relatively easy; to measure more subtle and perhaps crucial differences is more difficult though not impossible.²⁷

Procedures of the Investigation

Several steps were involved in the study process. Data collection included two distinct phases: completion of personal information and the three personality inventories by the 178 subjects at entrance to Elementary Intern Program, and six separate observations of overt classroom behaviors of the intern teachers during the final weeks of their internship teaching, May-June, 1969. The latter phase occurred approximately

²⁷ Ibid., 286.

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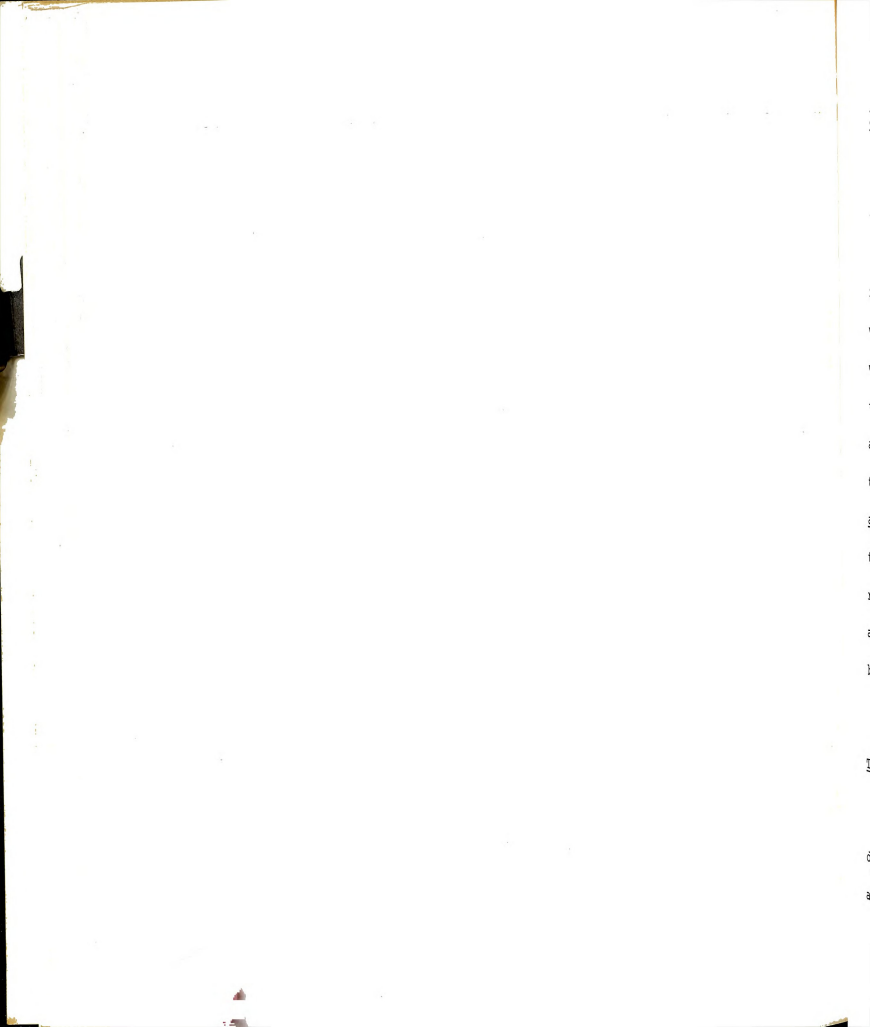
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-1/2 years after entrance to EIP. Data were prepared for analysis on the CDC 3600 computer at Michigan State University. Collection of data, preparation for analysis, and subsequent analysis are described in detail in this section.

Collection of Personal and Personality Data

During the first week of their methods courses and prior to contact with children in elementary school classrooms, the EIP pre-interns for Fall Term, 1967, and Winter term, 1968, completed the following forms: the Teacher Education Inventory, the Minnesota Teacher Attitude Inventory, the Edwards Personal Preference Schedule, and the Teacher Dogmatism Scale. Each of these paper-pencil inventories was completed under the supervision of the EIP center director at ten off-campus locations. Forms were collected, analyzed, and results for each recorded. A specially designed computer-based information retrieval system was developed to maintain records and provide ready access to data for further analyses.



Collection of Data on Overt Classroom Behaviors

In order to relate self perceptions of intern teachers to their overt teaching behaviors, observations in their classrooms were required. Intern consultants regularly visited and worked in interns' classrooms. It was assumed that consultants' presence in the classroom could not offset the general learning climate. Thus thirty-seven consultants could be asked to make six separate observations in each of their intern's rooms, and to record overt behaviors using the Observation Schedule and Record. On March 6, 1969, the researcher attended the EIP center directors' regular staff conference. The research project, procedures for training the observers, and making the observations were discussed and approved by the directors.

Training the Observers

A biannual conference for student teaching coordinators, EIP directors, and intern consultants is held at MSU's Kellogg Biological Station, Gull Lake. At the

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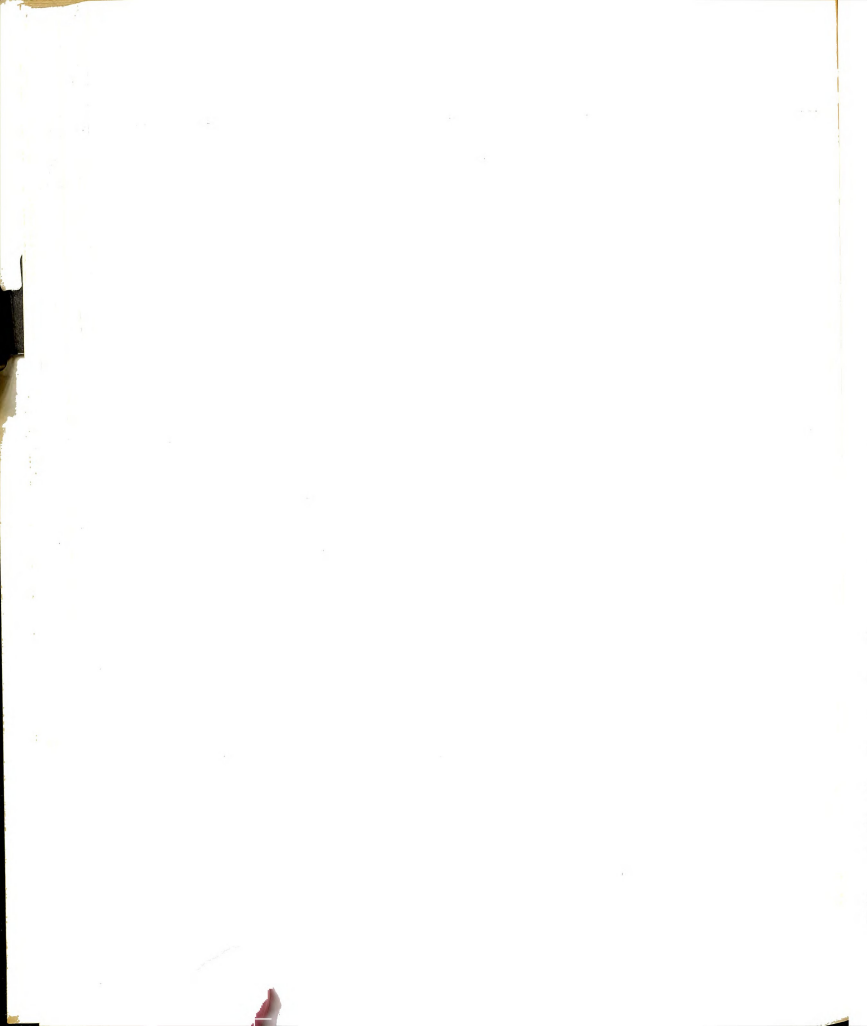
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spring Conference, April 23-25, 1969, four hours were devoted to study of the Observation Schedule and Record (OScAR) and practice in recording behaviors observed in filmed teaching episodes. To facilitate the study, conference participants received the OScAR Manual and recording form a week prior to the conference.²⁸

Training observers required several steps. First, a detailed study of the one hundred categories was made. Interpretation of the categories was facilitated through reference to descriptions included in the manual. After viewing the categories, the format of and procedures for using the recording form were presented to the conference participants. The recording sheet included one hundred categories for general classroom activities which were arranged for ease of marking. The categories were grouped under several headings: Teacher and Pupil Activities, Seating Arrangements, Teacher and Pupil Materials and Subject Matter Observed. A twenty-five minute observation period consisted of the following segments:

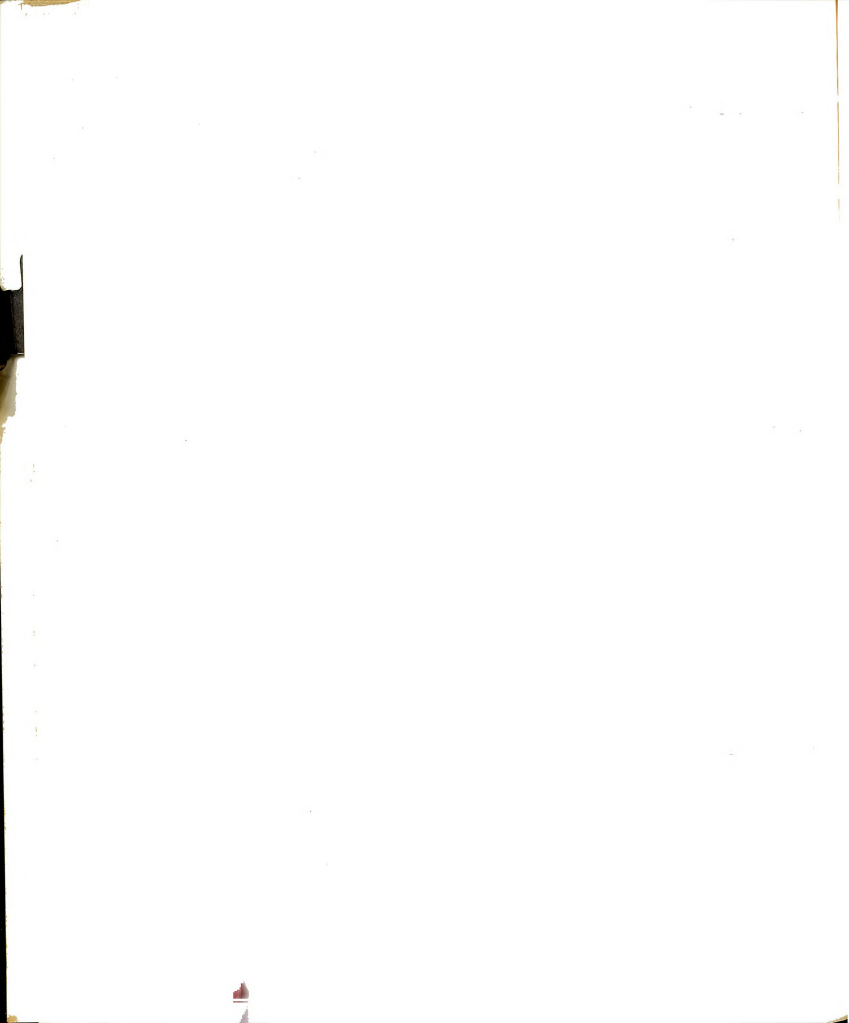
²⁸ See Appendix C for a copy of the OScAR Manual recording form.



<u>Five-minute interval</u>	<u>Observer Action</u>
First	Check observed behaviors in column labeled I.
Second	Observe only.
Third	Check observed behaviors in column labeled III.
Fourth	Observe only.
Fifth	Check observed behaviors in column labeled V.

Once the conference participants were familiar with the categories and the procedures for recording, filmed classroom episodes were used to acquire facility recording overt behaviors. Observers checked as many overt behaviors as they observed during the filmed episodes; subsequently a comparison of recorded behaviors was made. This pattern of observing-recording, then discussing-comparing was followed throughout the training session. Films used included SRA's short segments from Teaching Problems Laboratory, numbers 29, 8, 18, 10, 1,²⁹ and several 16 mm. films approximately thirty minutes long: (1) Keith, A Second Grader; (2) Dick, A

²⁹Donald Cruickschank, et al., Teaching Problems Laboratory, Critical Teaching Problems (New York: Science Research Associates, Inc.).



Fifth Grader; (3) Greg, An Eighth Grader; (4) Unit Teaching in Kindergarten; (5) Unit Teaching in Fourth Grade Science; and (6) General Objectives. Not all the available films were needed during the training sessions.

Before leaving the conference on April 25, 1969, each intern consultant was provided a stopwatch and recording forms to be used in observing teaching behaviors of each intern teacher in six separate sessions. Detailed directions were given and any remaining questions were answered.

Five regional meetings were held with intern consultants during the two weeks following training at Gull Lake. Dates of these conferences and the EIP Centers concerned were:

April 29, 1969 - Alpena

April 30, 1969 - Bay City-Saginaw and Port Huron at Bay City

May 2, 1969 - Grand Rapids

May 5, 1969 - Detroit, Macomb, and Pontiac at Macomb Center; East Lansing at East Lansing

May 9, 1969 - Battle Creek

Further questions of intern consultants were answered and consistency in interpreting categories and recording

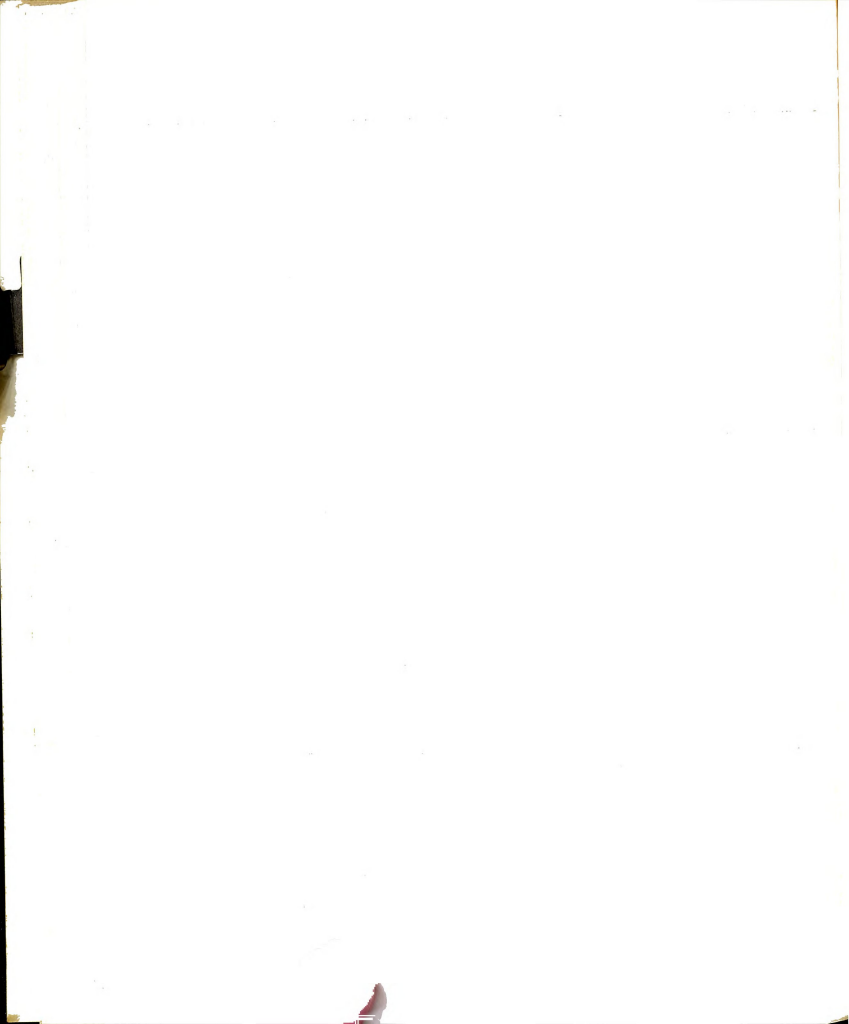


behaviors was checked. Actual teaching behaviors and filmed episodes were observed and recorded to check consistency.

Preparation of Data for Analysis

Following the regional training conferences, each of the thirty-seven consultants scheduled six observations each of the interns they supervised. These observations were completed and returned to the researcher by June 15, 1969. Thus all observations were made in a six-week period near the end of the subjects' first year of teaching. In all, 1,068 observations (6×178) were made. They were processed in three stages.

1. Each behavior in the separate categories was summed across the three time intervals of an observation.
2. These totals on each observation form were summed across the six observations for a particular intern teacher. Where fewer than six observations had been made, one of the remaining observations



was randomly selected and each recorded variable duplicated.

3. The raw score for each of the one hundred categories was recorded, verified, key-punched, and verified again. Raw scores for a particular behavior of a given subject ranged from zero (never observed in eighteen five-minute periods) to eighteen (observed in every five-minute period).

sis of Data

Data on the personality variables and the overt room teaching behaviors of the interns were subjected to factor analysis. Preparation of the data, statistics, computer routines, and the results of each step are summarized in Tables 3.9 and 3.10. The statistical techniques employed are described in detail subsequent to summaries.

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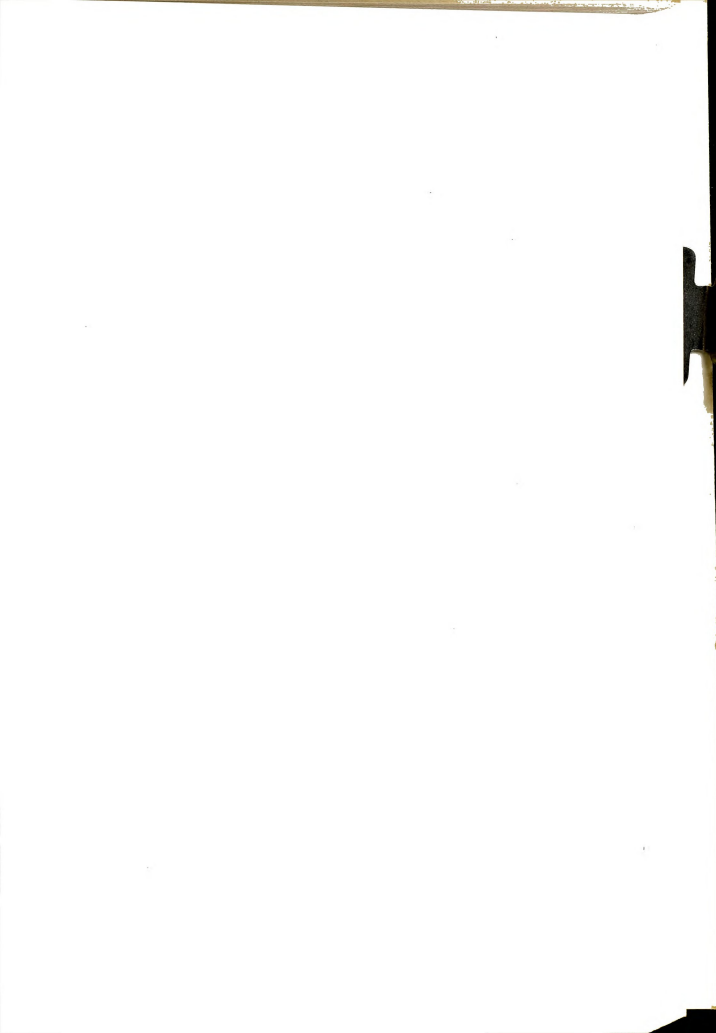


Table 3.9.--Stages in Analysis of Personality Variables.

Analysis	Routine	Results
1. Calculation of basic statistics for the sixteen variables of the EPPS, the MTAI and the Dogmatism scores of 178 intern teachers.	Basic Statistics (BSTAT) Agricultural Experiment Station, STAT Series Description Number 5, Michigan State University	Mean, standard deviation, skewness and kurtosis for each variable.
2. Omission of Abasement Score from the analysis so that the final score on the EPPS ipsative measure would not be determined.		
3. Random selection of eighty-eight intern teachers from the total sample to meet the limitations of the factor analysis routine.		
4. Factor Analysis (Q-technique for analyzing similarities among responses of people) of the fourteen EPPS scores, the MTAI and the Dogmatism scores of the eighty-eight intern teachers.	Factor Analysis, Principal Components and Orthogonal Rotations. Research Services of the Department of Communication, Michigan State University.	Two factors on the first rotated solution accounting for 92% of the total variance

Analysis	Routine	Results
5. Analysis of the factor loadings for each of the eighty-eight subjects on the two factors.	WRAP 2, Department of Communication, Program Brief Number 12.	Weighted standard scores for each of the sixteen personality variables on the two factors.
6. Linear Regression using the Method of Least Squares to estimate relationships between two personality types and scores of eighty-eight subjects on the sixteen personality variables which had been factor analyzed.	LS (Least Squares) Agricultural Experiment Station, SRAV Series Description Number 7, Michigan State University	Regression coefficients and beta weights for each of the sixteen personality variables used in the factor analysis.
7. Prediction of personality type for each of the 178 intern teachers on the basis of regression coefficients.	Special program written by John Draper, a statistics consultant.	Separation of the 178 intern teachers into two personality types.

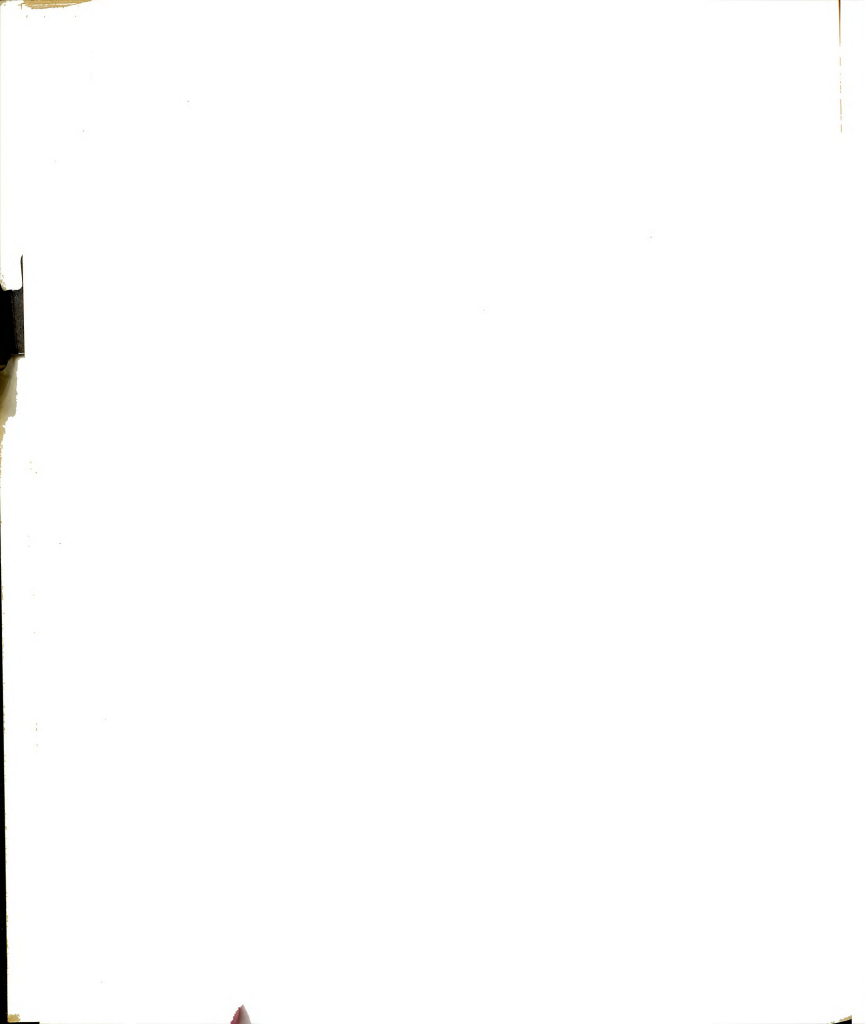




Table 3.10.--Stages in Analysis of One Hundred Overt Classroom Behavior Variables.

Analysis	Routine	Results
1. Calculation of basic statistics for the one hundred classroom observation variables for 178 intern teachers.	Routine IDCORR, Incomplete Data Correlation Program, Computer Institute for Social Science Research Technical Report Number 4.	Mean, standard deviation, skewness and kurtosis for each of the variables analyzed. Mean of a variable was recorded where data were incomplete.
2. Factor Analysis (R-type) of the one hundred variables for each of 178 intern teachers.	Factor Analysis, Principal Components and Orthogonal Rotations. Research Services of the Department of Communication, Michigan State University.	Eight rotated solutions. Fourth rotated solution yielded five factors accounting for 25% of the total variance. These five factors were used to describe five learning environments.
3. Computation of factor scores for the fourth rotated solution.	WRAP 2, Department of Communication, Program Brief 12.	Factor scores on each of the five factors for 178 intern teachers.
4. Multivariate analysis of variance of mean vectors for 178 intern teachers on:	Jeremy D. Finn, FINN Program for "Multivariate: Univariate and Multivariate	Tests of significance for the hypotheses.

Analysis	Routine	Results
a. personality types b. sex c. teaching levels	Analysis of Variance and Covariance," May, 1967. Research Services of the School for Advanced Study, College of Education, Michigan State University.	Mean and standard deviation of scores within each cell.
5. Computation of basic statistics for factor scores and discriminant scores of 178 subjects: males, females, K-2, 3-5, 6-8, and Special Education teachers.	BSTAT Routine	Mean and standard deviation of scores within each cell.
6. Scheffe' post hoc comparisons to test significance of differences between means for teaching levels on two sets of significant discriminant scores.	FINN Routine	Tests of significance of differences in means for twelve comparisons of various teaching levels.



Factor Analysis

Factor analysis is a multivariate analytical technique in which many variables are observed simultaneously without establishing priorities among them. In education, some of the most important variables cannot be controlled in the laboratory, and must be examined in situ. In such cases, many variables are recorded to reduce the possible sources of error.³⁰ When the numerous observed variables are intercorrelated, a matrix results. This intercorrelation matrix may be factor analyzed to serve any or all of the following goals:

1. To parsimoniously describe n variables in k factors where k is less than n ;
2. To suggest hypotheses; or
3. To support or disprove hypotheses related to structure or organization.

³⁰ Raymond B. Cattell, "The Three Basic Factor-Analytic Research Designs--Their Interrelations and Derivatives," Psychological Bulletin, XLIX (September, 1952), 514.



h factor obtained in the factor analysis is a condensed statement of linear relations derived from the set of variables.³¹

Factor analysis, from another point of view, defines the variance components of the total common factor variance. Several sources of variation contribute to the total variance of a measure:

$$V_t = V_{co} + V_{sp} + V_e$$

where V_t is the total variance of a measure; V_{co} is the common factor variance; V_{sp} equals the specific variance; V_e equals the error variance of the measure is denoted V_e . The number of factors obtained in describing the common variance of the variables indicates their complexity. A factor may be factorially "pure" or "complex," saturated with only one factor or loaded with several.³²

In a factor matrix, correlation coefficients (or loadings) express relations between the variables

³¹H. J. Eysenck, "The Logical Basis of Factor Analysis," American Psychologist, VIII (March, 1953), 108.

³²Fred N. Kerlinger, Foundations of Behavioral Research (Chicago: Holt, Rinehart and Winston, Inc., 1955-656).



alyzed and the underlying factors. In most factor analyses, the factor matrix is submitted to either orthogonal or oblique rotations to facilitate interpretation of the factor structure. Thurstone established simple structure principles for analysts to follow.³³ These principles apply to both orthogonal and oblique solutions.³⁴ Figure 3.1 portrays a generalized matrix showing a three-factor solution. Variable X_1 correlates r_{11} with the first factor and r_{13} with the third. The last column of the table is called the communality or h^2 . This "common factor variance" is determined by summing the squares of the factor loadings for a particular variable, such as:

$$v_{co} = h^2 = (r_{11})^2 + (r_{12})^2 + (r_{13})^2 + \dots + (r_{1k})^2$$

where k is the last factor extracted from the matrix.

³³Ibid., 667-670.

³⁴Rotation consists of a mathematical view of the factor structure from various angles to simplify the factor structure and identify the most invariant factor structures. Orthogonal rotation maintains independence between two factors so that their correlation is zero. Oblique rotations do not place this constraint upon the factors.

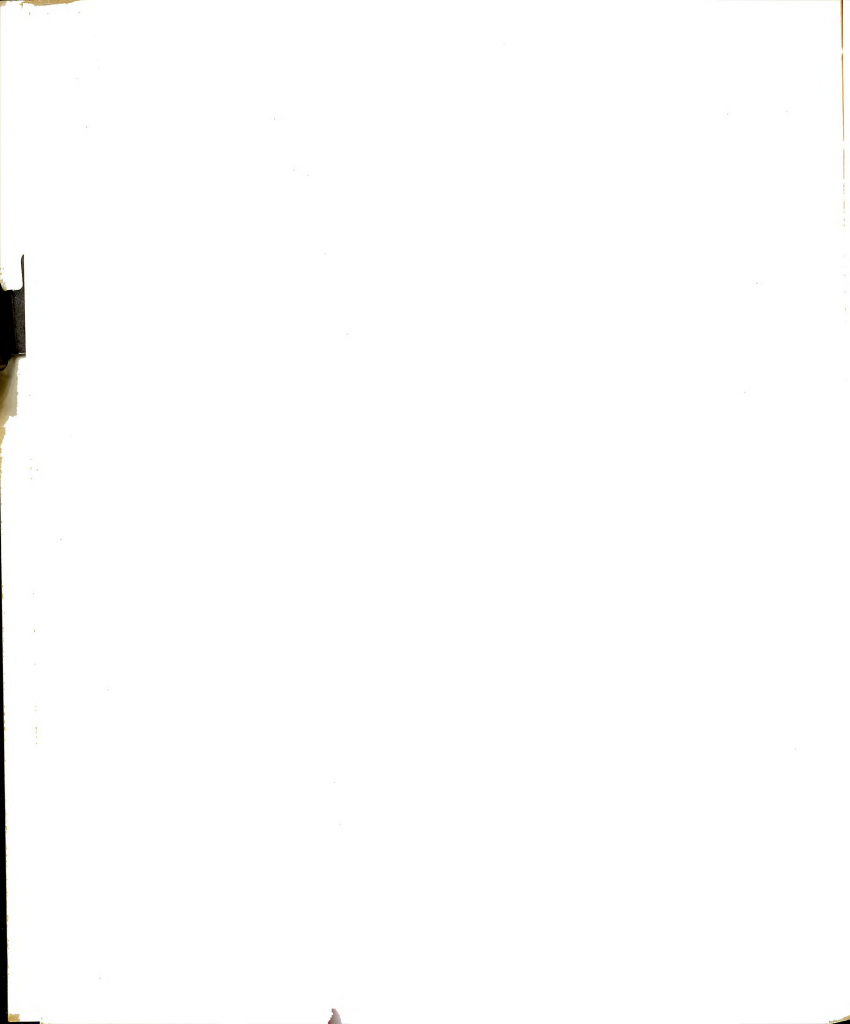


Variables	Factors			h^2
	1	2	3	
r_{11}	r_{12}	r_{13}	$h_{x_1}^2$	
r_{21}	r_{22}	r_{23}	$h_{x_2}^2$	
r_{31}	r_{32}	r_{33}	$h_{x_3}^2$	
.	.	.	.	
.	.	.	.	
.	.	.	.	
r_{n1}	r_{n2}	r_{n3}	$h_{x_n}^2$	

Figure 3.1.--Generalized Factor Matrix.

The researcher may select one of several types of factor analysis, depending on the kind of variables comprising the correlation matrix.³⁵ In R-type factor analysis, variables or tests for a sample of people are correlated as in the analysis of OSCAR III variables. If, however, similarities between persons interests the

³⁵ Catell, "Three Basic Factor-Analytic Research Designs--Their Interrelations and Derivatives," 499-520.
 Olm S. MacLean, Jr., "Some Multivariate Designs for Communications Research," Journalism Quarterly, XLII (Summer, 1965), 614-622.



estigator then people are correlated with each other
 a sample of responses or tests. Q-technique, as this
 of factor analysis is called, was utilized with the
 ty-eight subjects' personality test scores on sixteen
 ables. Procedures in using R and Q types are de-
 bed in the following paragraphs.

Q-type Factor Analysis

R analysis involves correlating and factoring
 ables for a sample of persons with time held con-
 e.³⁶ The principal aspects of factor analysis of
 ons' overt behaviors is illustrated in the following
 which parallels this investigation.

First, a score matrix for 178 intern teachers
 e hundred dimensions of classroom behaviors was
 lated.

³⁶ MacLean, "Some Multivariate Designs for Com-
 ations Research," 614.



Person	Classroom Observation Variables							
	X_1	X_2	X_3	X_4	X_5	.	.	X_{100}
11	6	0	3	4	.	.	.	0
11	15	9	0	2	.	.	.	0
16	8	0	2	9	.	.	.	0
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
12	15	5	0	1	.	.	.	0

Figure 3.2.--Score Matrix of One Hundred Classroom Observation Variables for 178 Subjects.

Person 3 was observed questioning pupils more often (Variable 1) than Persons 1, 2, or 178. Every variable in the score matrix was correlated with every other variable, yielding a correlation matrix of the following form:

Variables	X_1	X_2	X_3	X_4	X_5	.	.	.	X_{100}
	1.00								
	.28	1.00							
	.26	.07	1.00						
	.14	.25	.22	1.00					
	-.09	-.20	.03	.27	1.00				
	.	.	.	.	.	.			
	.	.	.	.	.	.	.		
	-.04	.08	-.02	.00	-.06	.	.	.	1.00

Figure 3.3.--Correlation Matrix of One Hundred Classroom Observation Variables for 178 Intern Teachers.

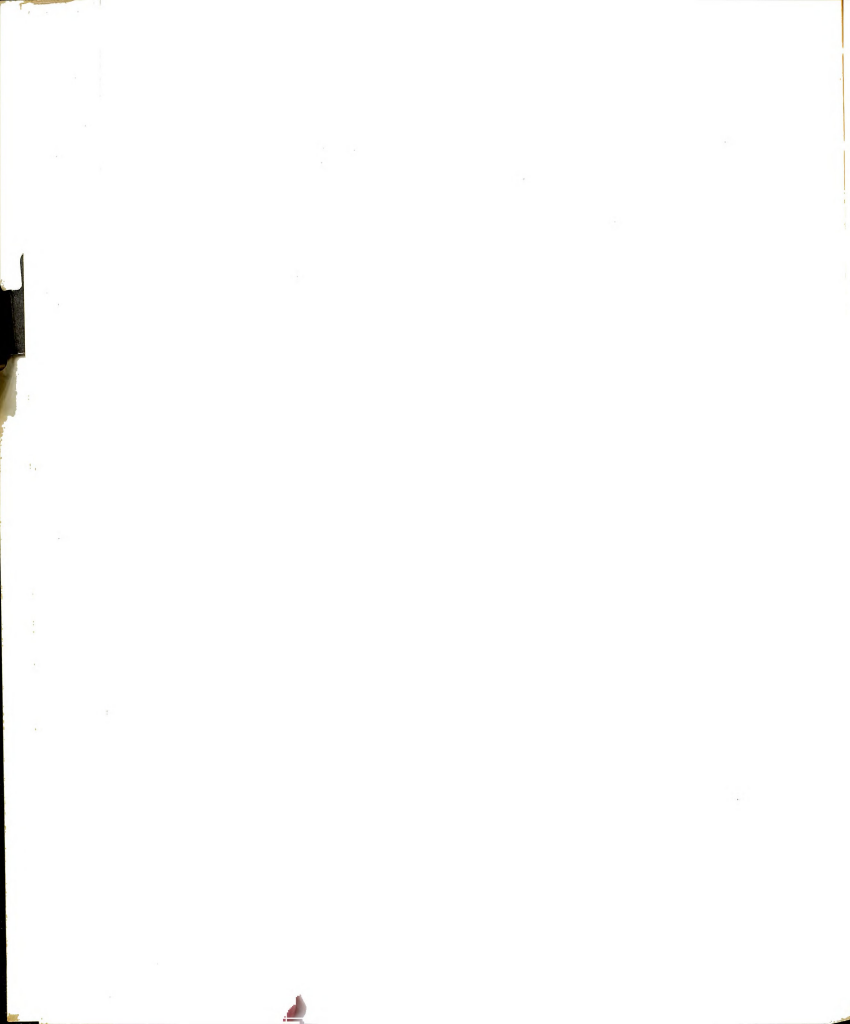


Variable 1, "Teacher questions, pupil answers," correlated .8 with Variable 2, "Teacher answers pupil question," and .6 with Variable 3, "Teacher interrupts pupil." Variable 10 was checked if some subject other than those listed had been observed. It had very low correlations with all other variables.

The correlation matrix was analyzed by means of orthogonal rotations to extract the underlying dimensions among the one hundred variables. Eight rotations were made, each successive rotation extracting an additional factor. Table 3.11 summarizes the proportion of variance explained by each factor in each rotation.

Table 3.11.--Percent of Variance Explained by Each Factor in the Eight Rotated Solutions of 100 Classroom Observation Variables.

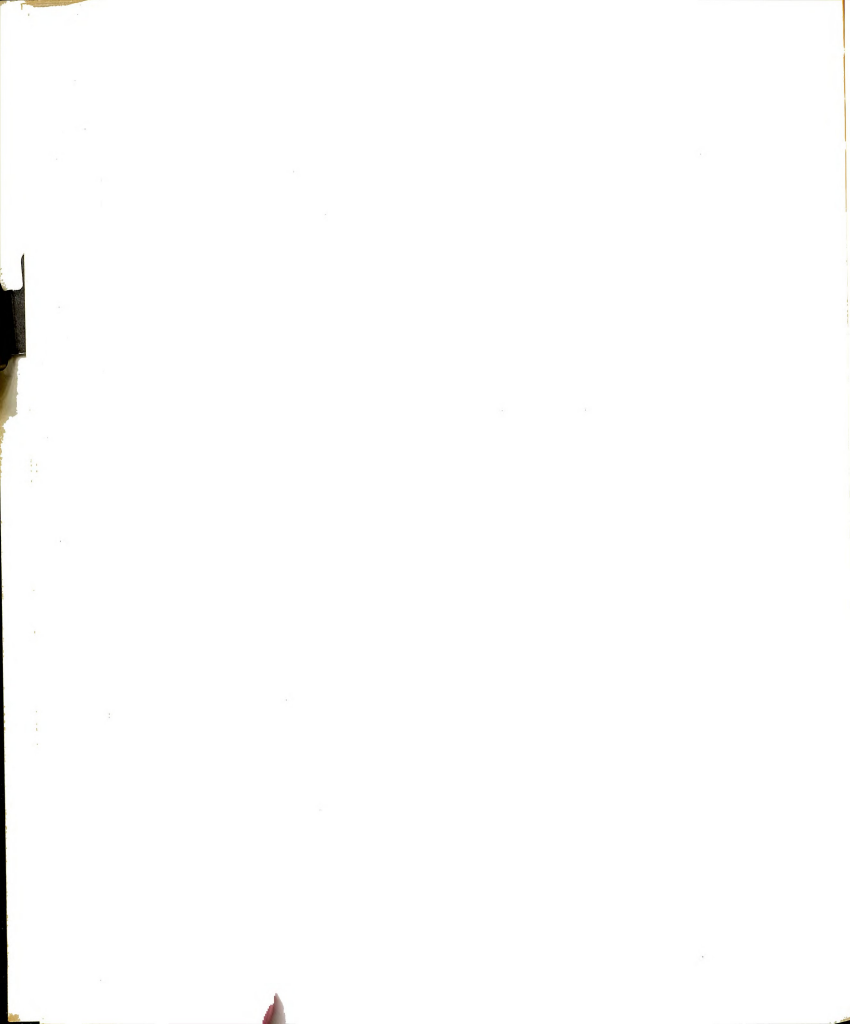
Rotation	Factors									Total Variance Explained
	I	II	III	IV	V	VI	VII	VIII	IX	
1st	8	6								14
2nd	7	6	5							18
3rd	5	5	7	5						22
4th	7	5	5	4	4					25
5th	5	7	5	4	4	4				29
6th	7	5	5	4	4	4	4			33
7th	5	7	5	4	4	4	4	3		36
8th	6	5	5	3	4	4	4	3	4	38



It can readily be seen that additional factors explained very small amounts of the total variance. If communalities rather than unities had been inserted in the diagonal of the matrix, more true variance could have been explained. Though the eighth rotated solution accounted for the greatest amount of variance (38%), the overall description of data would not be as parsimonious as a solution having fewer factors.

Cattell suggests a scree test for selecting the minimum number of factors to be extracted from the matrix. For this test, the eigenvalue curve is plotted.³⁷ The scree point or inflection in the curve indicates the number of factors accounting for most of the variance. After the scree point is reached, the curve tapers to a relatively straight line or scree indicating that successive factors explain equally small amounts of the total variance. Figure 3.4 shows the eigenvalue curve and the scree point for classroom observation data analyzed in

³⁷ Raymond B. Cattell, "The Meaning and Strategic Use of Factor Analysis," Handbook of Multivariate Experimental Psychology, edited by Raymond B. Cattell (Chicago: Rand McNally & Co., 1966), 206. Eigenvalues are latent roots in the solution of a matrix form of an equation.



this study. Thirty-two eigenvalues exceeded the threshold value of one.

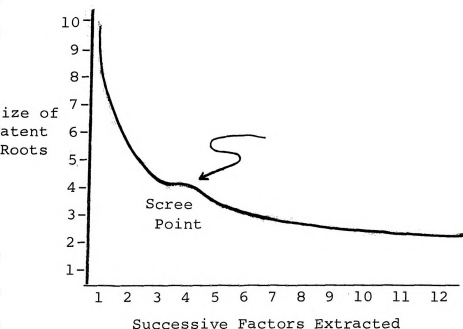
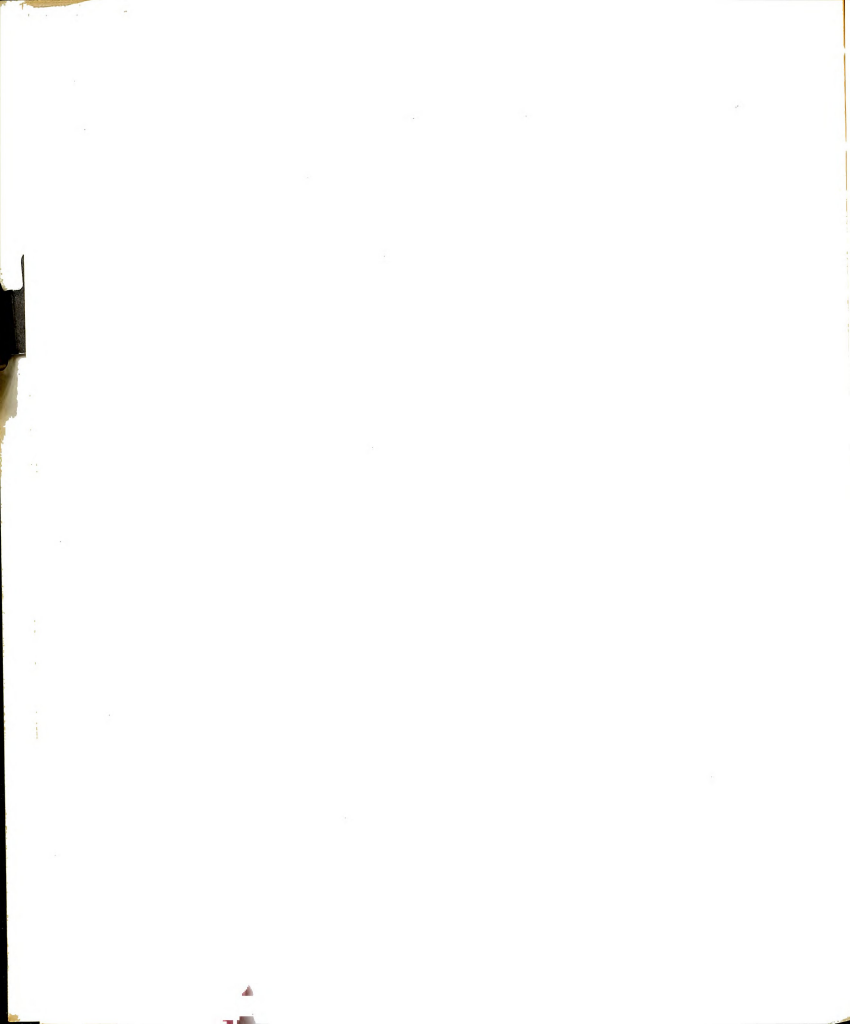


Figure 3.4.--Scree Slope Indicating the Minimum Number of Factors to be Extracted from the Factor Matrix Based on 100 Overt Classroom Behaviors.

The fourth rotated solution was selected for further analysis on the basis of:

1. The scree test;
2. The proportion of variance explained;
3. Parsimoniousness in describing the variables; and
4. Conceptual meaningfulness of the factors.



By analyzing the factor loadings, five learning environments were identified and described: Supportive, Conventional, Independent, Enriched, and Hostile. Descriptions are presented in Chapter IV.

Q-type Factor Analysis

Q analysis correlates and factors persons for some sample of tests, again holding time constant. According to Cattell, Q analysis is simply the obverse of R-type analysis. Q technique is concerned with the patterns of response of an individual and the degree of similarity between persons in their patterns of response. Correlation and factoring places an individual with other persons who respond as he does. While R-type analysis is normative, Q-type is ipsative.³⁸

Eighty-eight subjects were randomly selected from the total sample. The matrix of personality scores for these individuals was transposed so that columns contained sixteen personality scores for one individual and rows

³⁸ MacLean, "Some Multivariate Designs for Communications Research," 614-616.



obtained all personality scores from the same scale or test. Figure 3.5 indicates the form of the matrix and some of the score values.

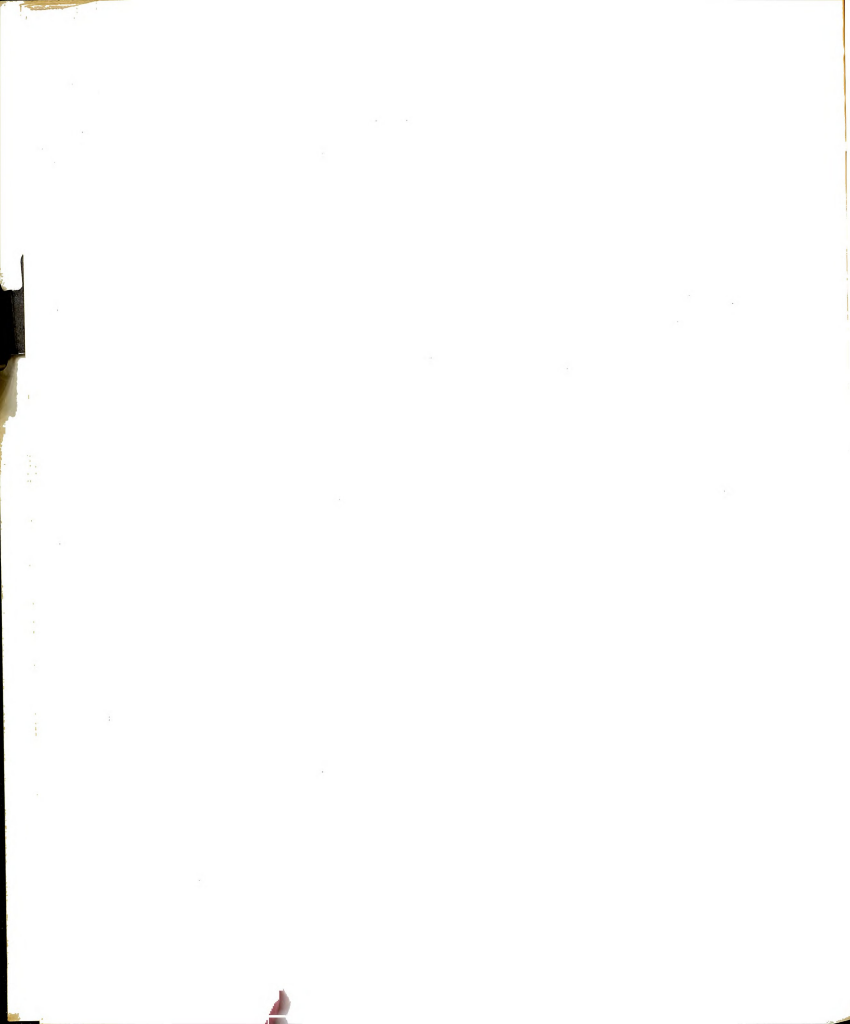
Personality Score	Person							
	1	2	3	4	5	.	.	.
Achievement	15	16	19	14	15	.	.	15
Reference	15	10	20	12	6	.	.	9
Order	15	11	10	8	11	.	.	3
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.	.
dogmatism	60	80	66	64	58	.	.	49

Figure 3.5.--Transposed Matrix of Personality Scores for 178 Elementary Intern Teachers.

Each person was then correlated with every other person, yielding an 88 x 88 matrix of correlations as follows:

Person	1	2	3	4	5	.	.	.	88
1	1.00								
2	0.95	1.00							
3	0.85	0.82	1.00						
4	0.78	0.81	0.68	1.00					
5	0.92	0.92	0.86	0.79	1.00				
.	.	.	.	.	.	.			
.	.	.	.	.	.	.	.		
.	.	.	.	.	.	.	.	.	
8	0.88	0.89	0.92	0.78	0.88	.	.	.	1.00

Figure 3.6.--Intercorrelation Matrix of Eighty-Eight Intern Teachers.



Persons 1 and 2 correlated .95 while Persons 3 and 4 correlated only .68. The first pair responded similarly on the sixteen tests and the latter pair differed markedly.

Two and three factor solutions were obtained, accounting for 92 and 94 percent of the total variance respectively. Figure 3.7 shows the eigenvalue curve for the factor solutions. Only four latent roots exceeded the threshold value of one.

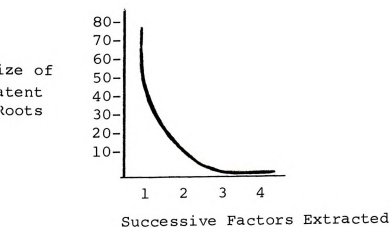
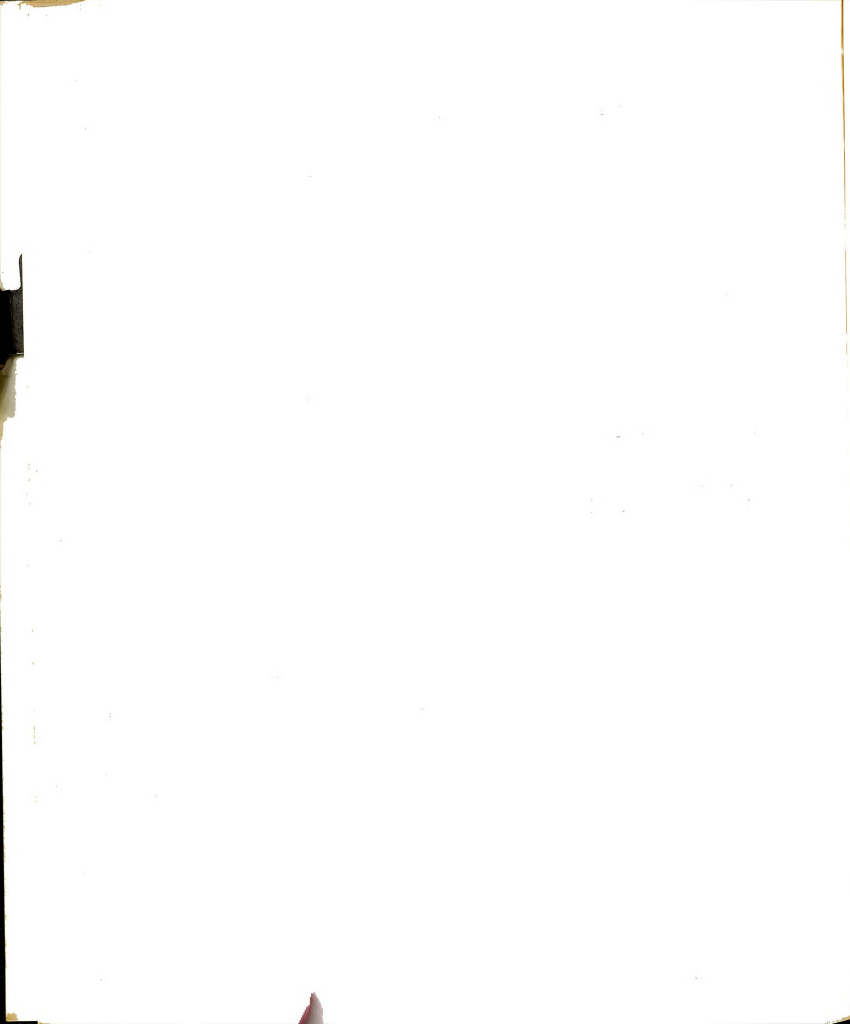


Figure 3.7.--Scree Slope Indicating the Minimum Number of Factors to be Extracted from the Factor Matrix Based on the Personality Data.

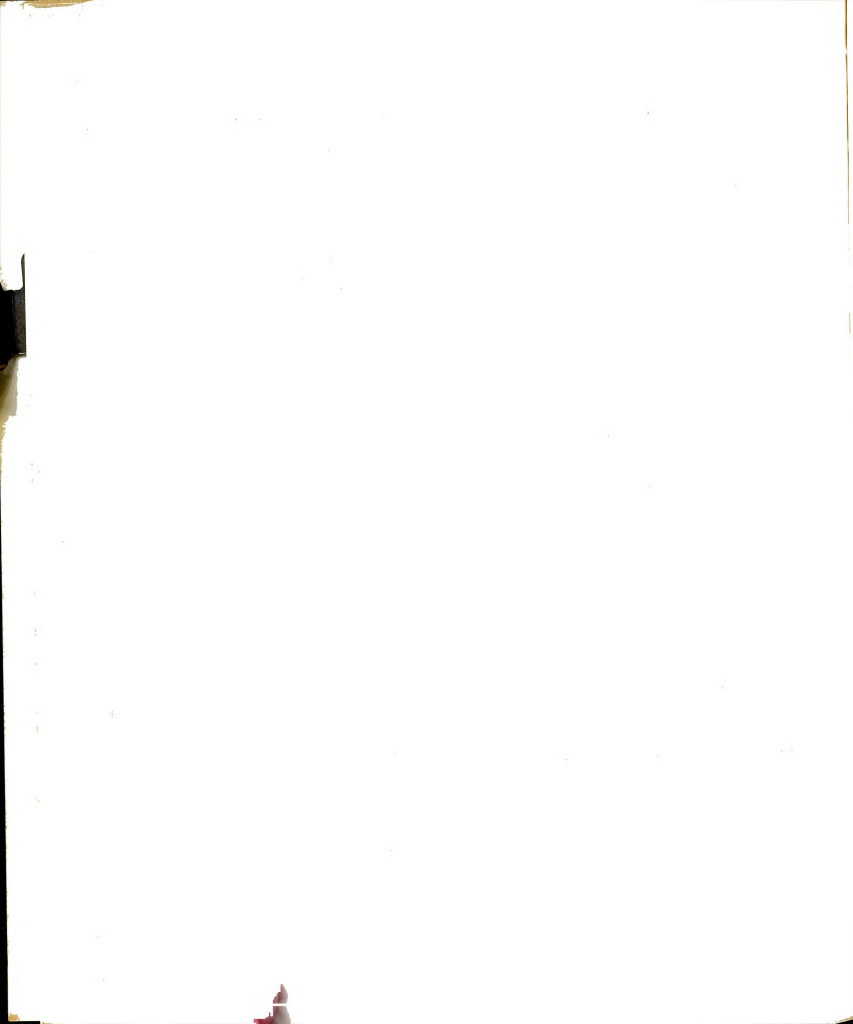
Obviously, the third factor contributed little to either the descriptiveness of description or proportion of variance explained. Thus the first rotation, i.e., the two-factor solution was selected for further analysis.



Each person was assigned to a particular personality type on the basis of his highest loading. To determine the "personality profile" or describe the "type," weights derived from the factor loadings were applied to the original score matrix for the eighty-eight subjects. The distributions were standardized and item descriptions given. These descriptions indicated how individuals in a particular personality type were alike, and enabled the researcher to name the types: the Self-Centered Personality and the Well-Integrated Personality. Results for each of these processes are reported in Chapter IV.

Multivariate Analysis of Variance

The factor scores of a subject on the five learning environments were considered a vector response. Each cell in the design contained vector responses of the individuals classified in that cell. Two designs were employed.



DESIGN ONE

Sex	Personality Type	
	Self-Centered	Well-Integrated
Males		
Females		

DESIGN TWO

Sex	Teaching Levels			
	K-2	3-5	6-8	Special Ed.
Males				
Females				

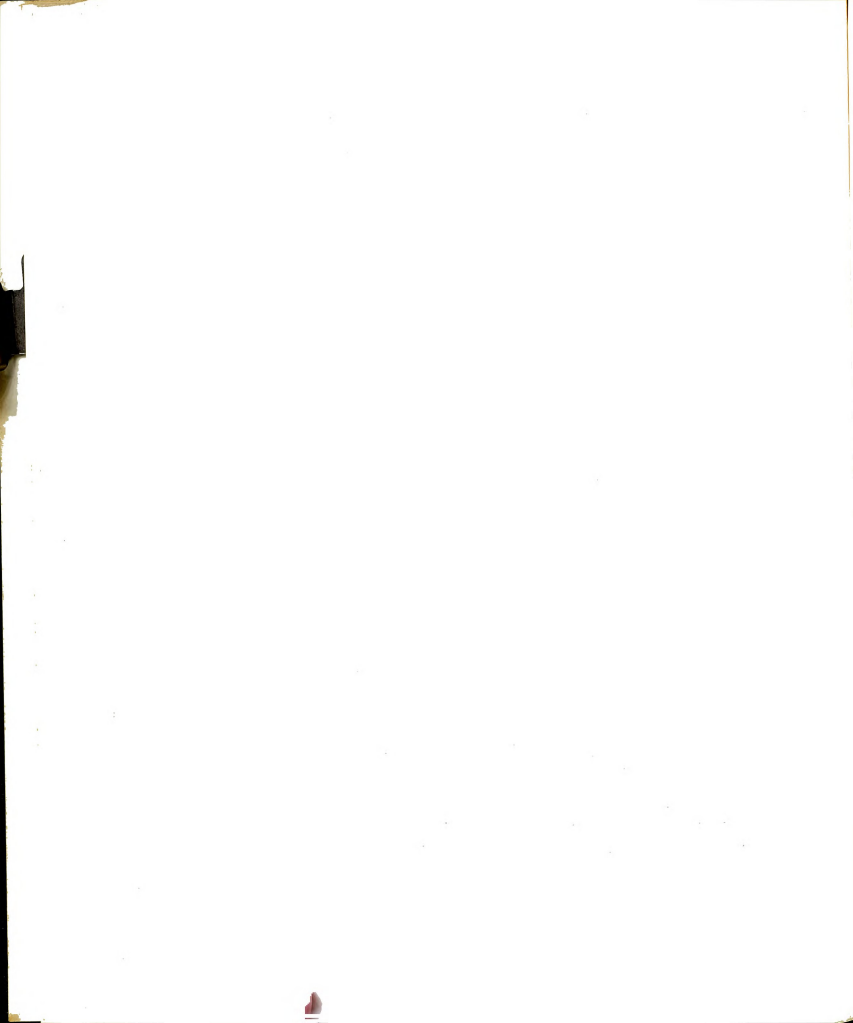
The design of this multivariate experiment paralleled the familiar univariate case. In the statistical analysis, the probability on the null hypothesis of the observed mean difference between personality types, sex of intern teachers, and teaching levels for the five learning environments simultaneously was obtained by an exact multivariate test of significance. Univariate tests could have been performed on each variable separately. But a single probability statement applicable to all



variables jointly could not generally be obtained from the separate tests. Because the five scores were obtained from the same subjects, they were correlated in some arbitrary and unknown manner, and the separate F-tests would not be statistically independent. The multivariate test, on the other hand, was based on sample statistics which take into account the correlations between variables and have known exact sampling distributions from which the required probabilities could be obtained.³⁹

In order to generate results which allow inferences to a specified population, the within-cell residuals must have the multivariate normal distribution with a common covariance matrix, and observations on different individuals must be uncorrelated. Unlike univariate analysis, multivariate statistical inference has not yet been proven robust to violations of these assumptions. Investigating the assumptions systematically through Monte Carlo methods is a formidable task even with

³⁹R. Darrell Bock and Ernest A. Haggard, "The Use of Multivariate Analysis of Variance in Behavioral Research," Handbook of Measurement and Assessment in Behavioral Sciences, ed. by Dean Whitla (Reading, Mass.: Addison-Wesley Pub. Co., 1968), 102.



high-speed computers.⁴⁰ However, the multivariate test is conservative. Conclusions of the investigation could be generalized with extreme caution, and only to populations identical to the study sample.

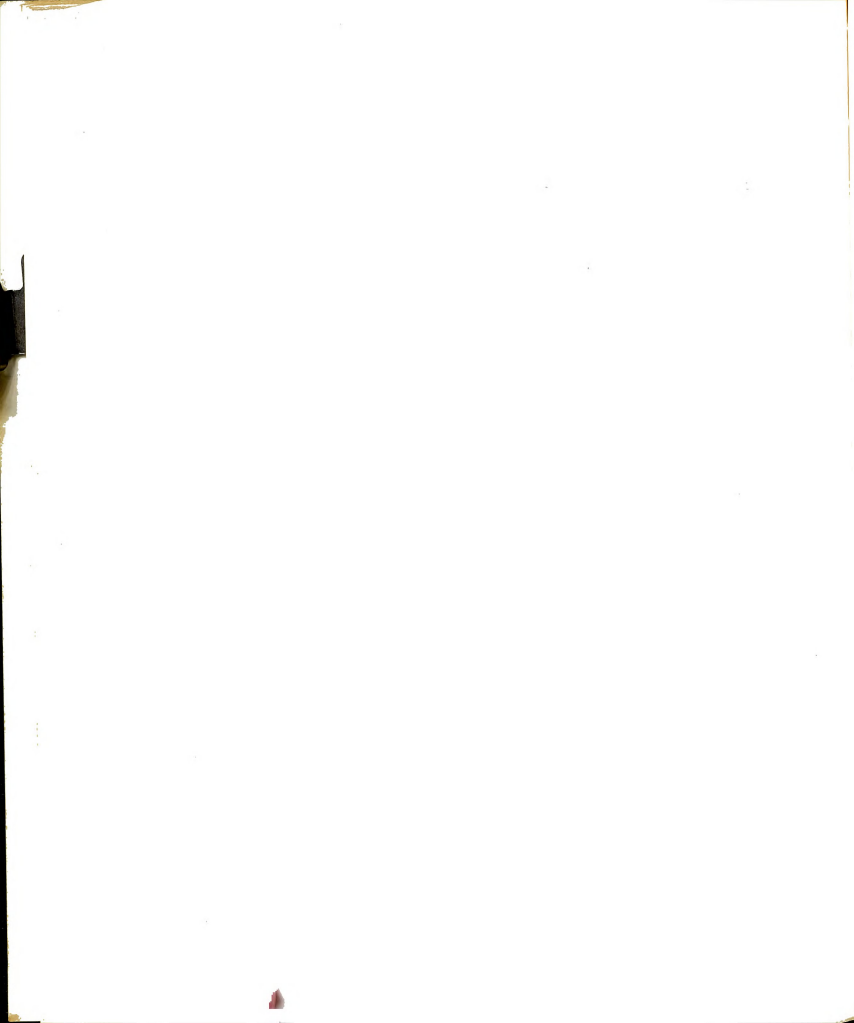
Scheffe' post hoc comparisons were made after the multivariate analysis of variance had shown significant differences in learning environments between male and female teachers and between teachers at different levels. Since twelve comparisons were made, a fiducial level of .01 was selected for the overall test and .001 for the separate tests.⁴¹

Summary

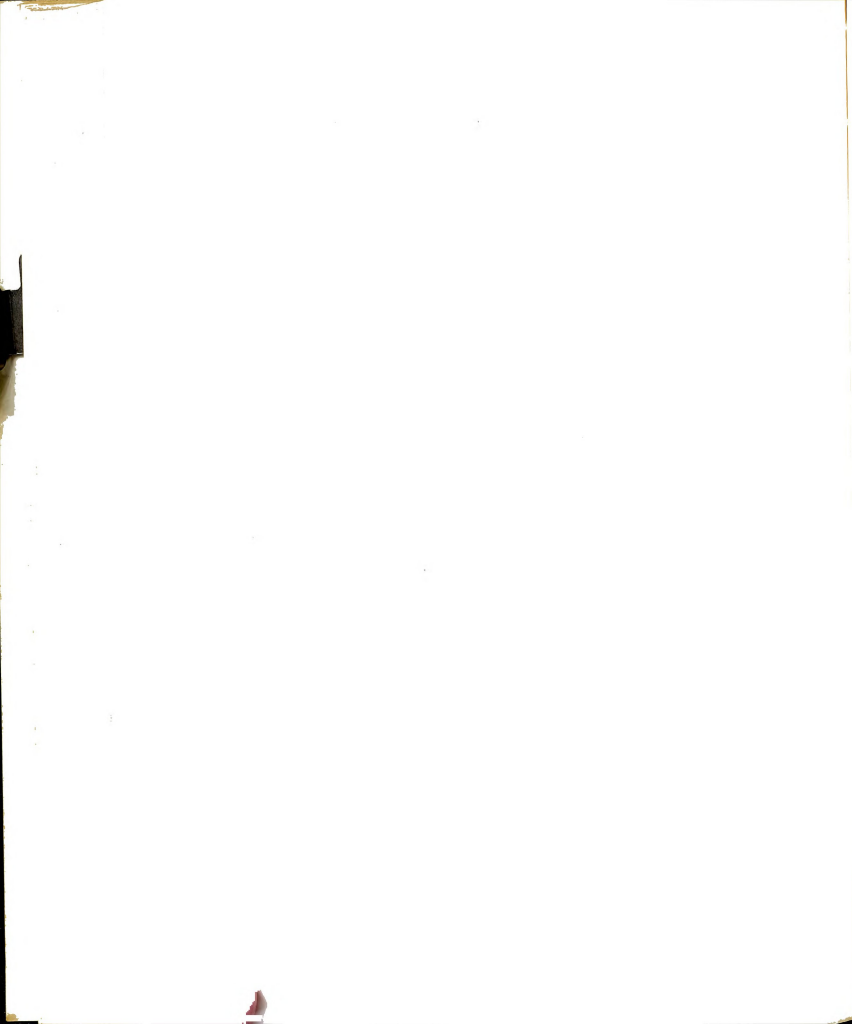
A detailed description of the procedures of this investigation was presented in this chapter. Demographic

⁴⁰ Lyles Jones, "Some Illustrations of Psychological Experiments Designed for Multivariate Statistical Analysis," A paper presented at a conference on Multivariate Experimentation, Allerton Park (University of Illinois), November 15, 1960.

⁴¹ Roger E. Kirk, Experimental Design: Procedures for the Behavioral Sciences (Belmont, California: Brooks/Cole Publishing Company, 1968), 79-81.



data for the sample was given, instruments utilized in the study were previewed, and stages in the analysis were delineated. Finally, the statistical techniques employed in the study were described at length. Chapters IV and V provide the results of the analysis.



CHAPTER IV

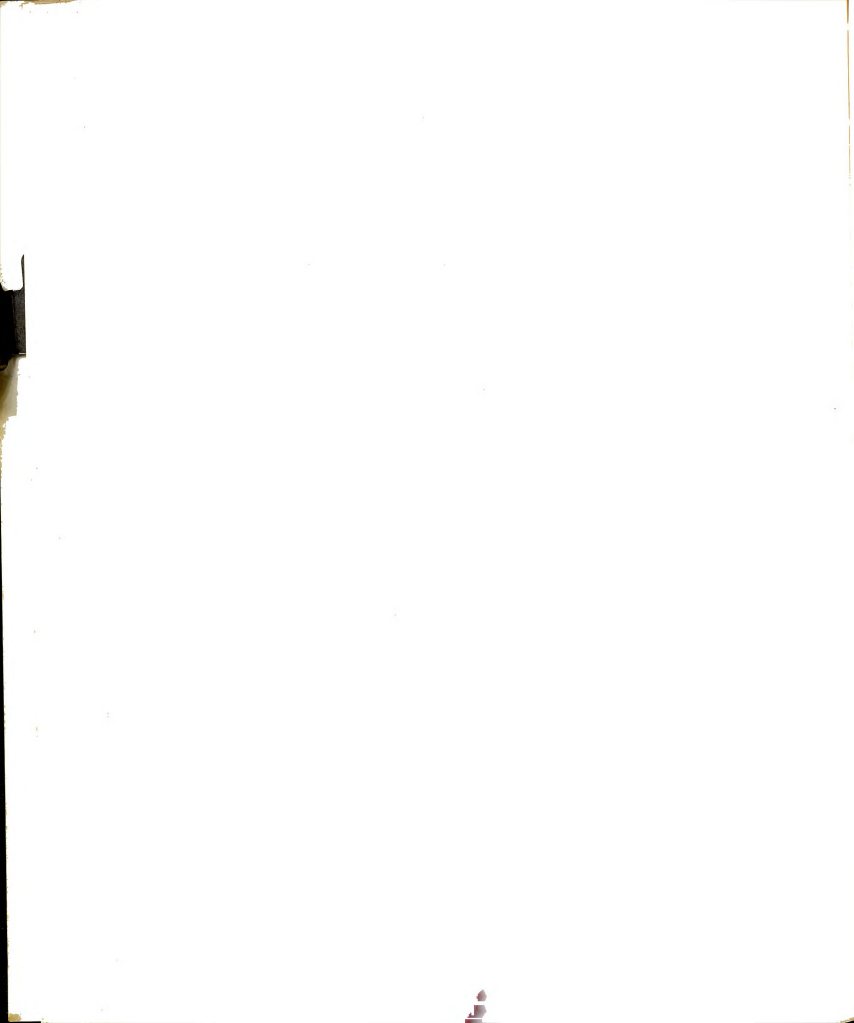
RESULTS OF THE FACTOR ANALYSIS

Introduction

The general nature of factor analysis and the two types, R and Q, used in this investigation were discussed in the previous chapter. Results of the exploratory factor analyses are presented here. Personality types are described first, then the learning environments are delineated.

Personality Types

Personality of a teacher is an important variable in the classroom, if not the most important variable. Numerous investigations on the subject of teacher personality and teacher effectiveness indicate its interest to researchers. Teacher personality has been probed from many points of view: attitudes, values, interests, needs, beliefs, etc. Descriptions using one, a set, or even all

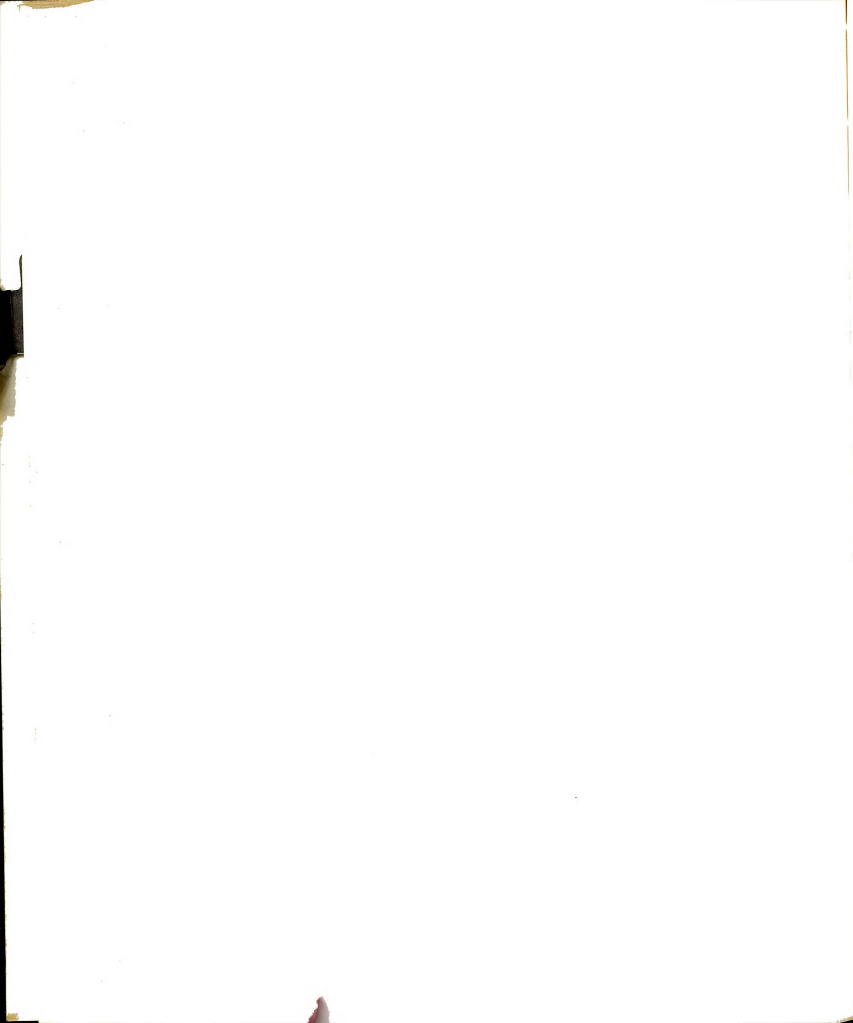


the constructs are still limited. Nevertheless, using a set of these constructs would provide a more valid picture of teacher personality than any single construct. Gordon hypothesized that the needs-system or pattern of needs of a teacher was more important than a single need when related to classroom behaviors.¹ Parallel to her theory we could conjecture that the pattern of constructs, the organization of attitudes, needs, and beliefs contributing to a teacher's personality is more important than a single construct when related to overt classroom behaviors.

Though each teacher has a unique personality, each teacher is a unique type, some teachers are more alike than others. Perhaps the organization of attitudes, needs, and beliefs within the personality is related to similarities observed.

Types of teacher personality were explored in this study by analyzing score patterns on the Minnesota Teacher Attitude Inventory, the Edwards Personal Preference Schedule and the Rokeach Dogmatism Scale. Eighty-eight

¹Ira J. Gordon, "Assessment of Classroom Emotional Climate by Means of the Observation Schedule and Record," Journal of Teacher Education, XVII (Summer, 1966), 224-226.



intern teachers were randomly selected from the total sample. The score patterns value for each subject was correlated with that of every other subject. This inter-correlation matrix was factor analyzed and a principal axis solution obtained. Varimax rotations of this solution produced two orthogonal factors accounting for 92% of the total common factor variance. Persons were clustered around two common syndromes of attitudes, needs, and beliefs; that is, each factor represented a personality type.

Intern teachers were associated with one of the two personality types on the basis of their highest loading or correlation with a factor. Tables 4.1 and 4.2 summarize the subjects assigned to each type, their loading on each factor, and the communality (h^2) or proportion of common factor variance explained in the rotated solution. Sixty-two teachers correlated highest with the first factor (α) which accounted for 56% of the total variance. Fewer subjects ($N = 26$) loaded highest on the second factor (β) which explained an additional 36% of the total variance.

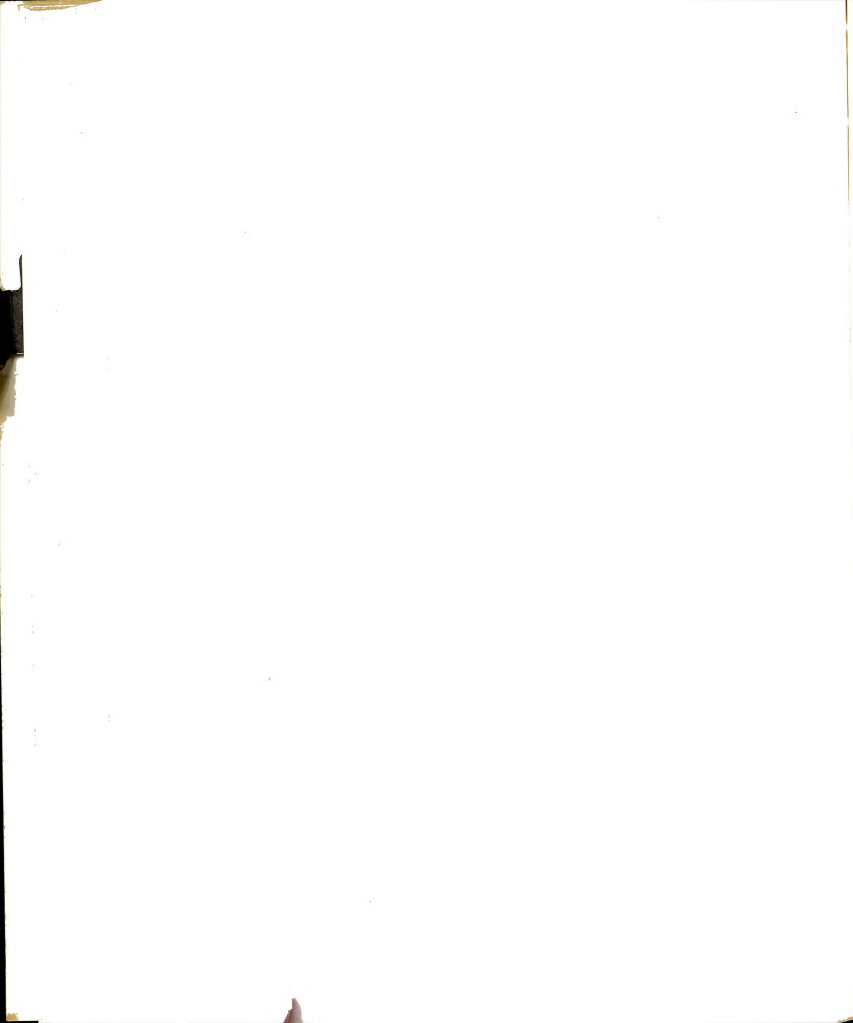


Table 4.1.--Subjects with Highest Loading on Factor α .*

Subject Identification	Loadings		h^2
	Factor α	Factor β	
105	985	030	971
121	969	135	957
171	963	121	943
114	963	167	954
74	961	-033	925
108	960	184	955
75	957	000	916
104	954	-238	967
122	953	259	975
221	951	180	937
99	951	222	954
81	933	204	913
158	928	150	884
7	925	113	869
84	920	389	998
182	911	285	911
185	906	306	914
85	906	329	928
73	901	325	918
205	901	375	953
152	893	238	854
42	893	413	968
72	892	449	997
67	888	271	861
3	881	418	951
100	880	406	940
176	880	293	861
1	876	414	938
159	874	432	950
128	860	471	961

*Fifty-six percent of the total variance is accounted for by Factor α .

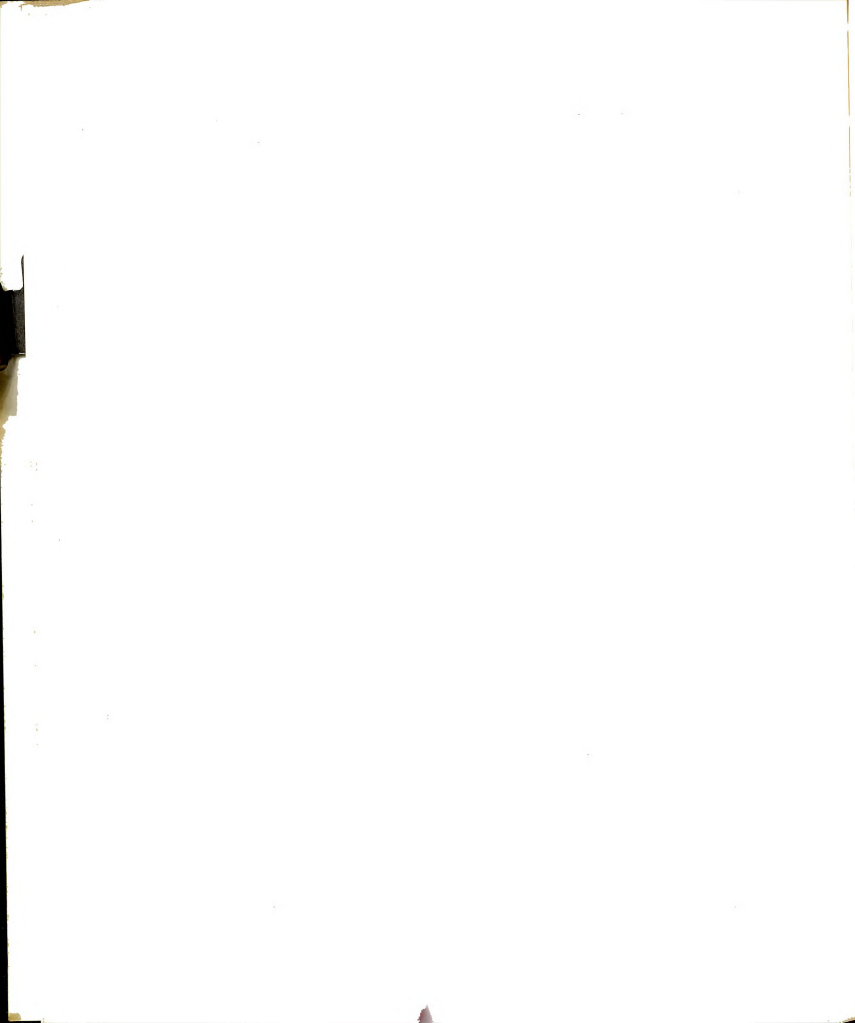


Table 4.1.--Cont.

Subject Identification	Loadings		h^2
	Factor α	Factor β	
175	836	519	968
193	836	501	950
160	835	-112	710
12	825	495	926
53	821	501	924
164	816	500	915
101	807	539	941
151	806	517	917
132	803	578	979
31	802	546	941
138	801	548	941
41	801	560	955
88	797	433	822
194	797	474	859
76	794	606	998
19	782	456	819
96	772	593	947
116	766	558	898
126	764	559	896
131	763	464	798
98	760	564	897
51	753	584	908
30	745	611	929
18	731	637	940
127	726	647	946
107	717	650	938
65	714	603	873
58	702	607	861
144	699	602	850
43	699	686	959
8	674	549	756
95	665	653	869

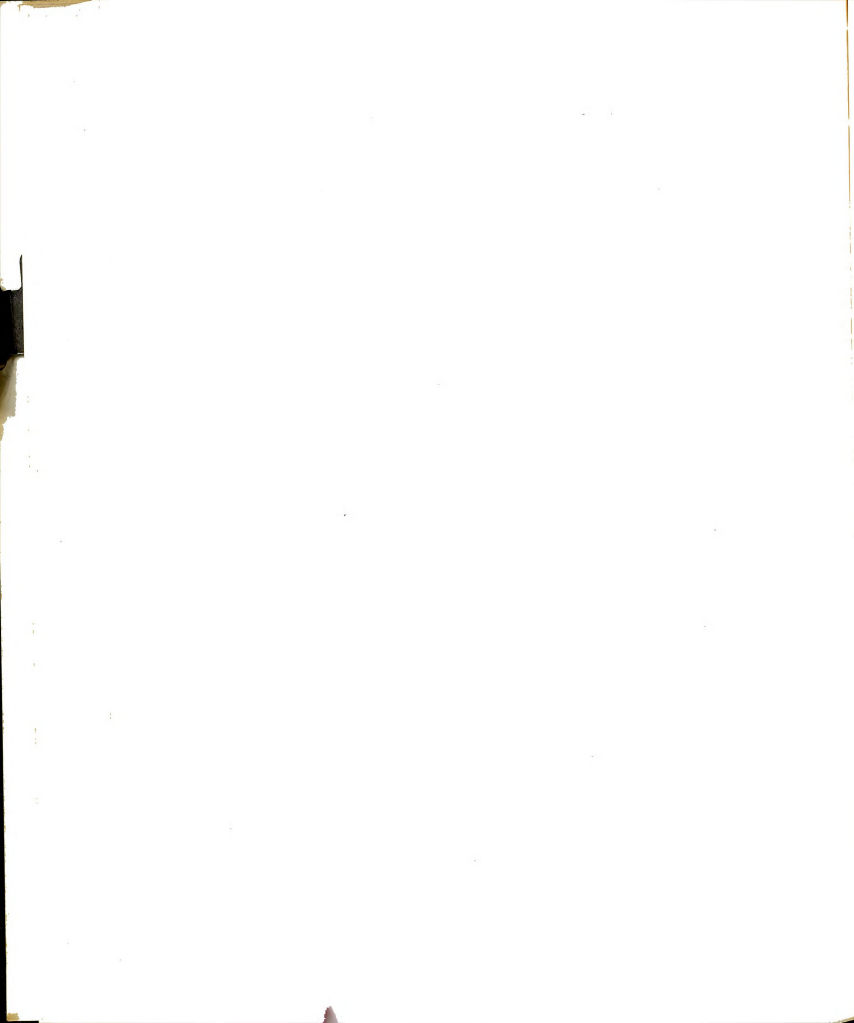
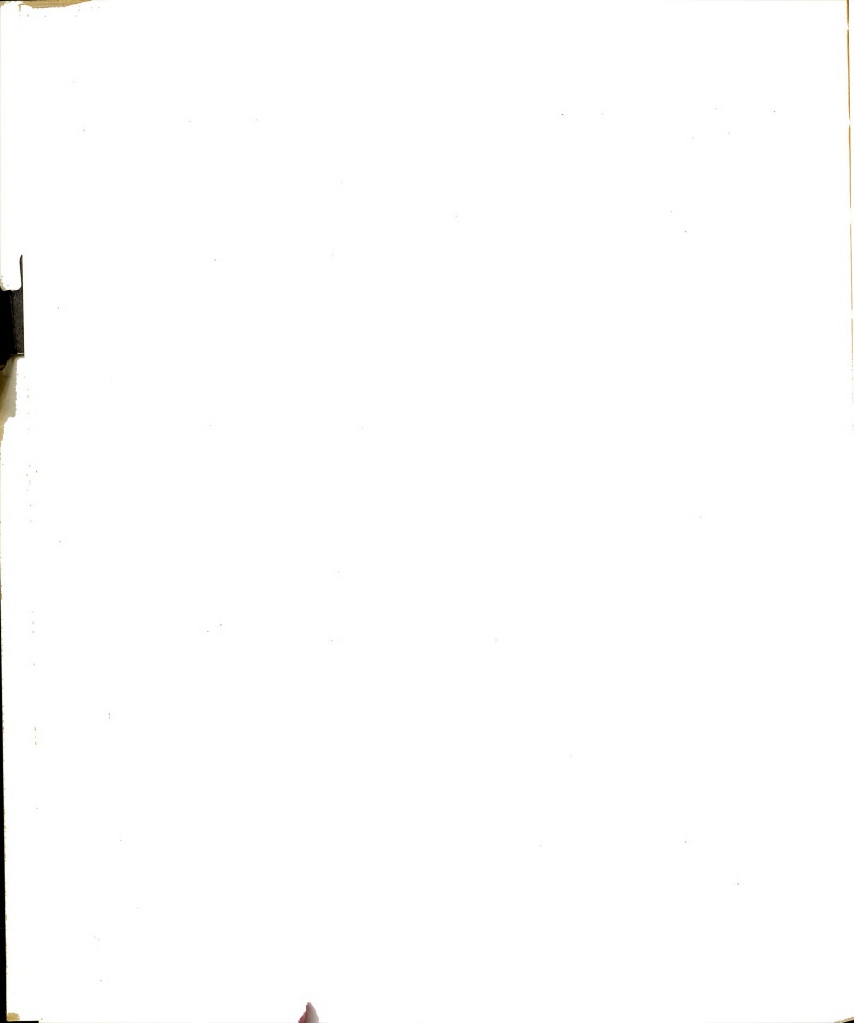


Table 4.2.--Subjects with Highest Loadings on Factor β .*

Subject Identification	Loading		h^2
	Factor α	Factor β	
147	985	-081	977
22	979	-095	967
25	972	141	964
192	968	010	937
38	955	088	919
83	953	061	912
35	946	022	896
186	941	140	905
201	938	299	969
120	930	103	876
106	922	262	920
17	920	346	966
157	877	476	996
134	874	398	922
174	864	426	928
169	831	436	880
48	813	462	875
20	786	587	963
199	783	469	834
102	781	600	970
92	775	545	897
213	760	538	868
214	739	630	942
94	714	619	893
32	695	632	883
154	694	655	910

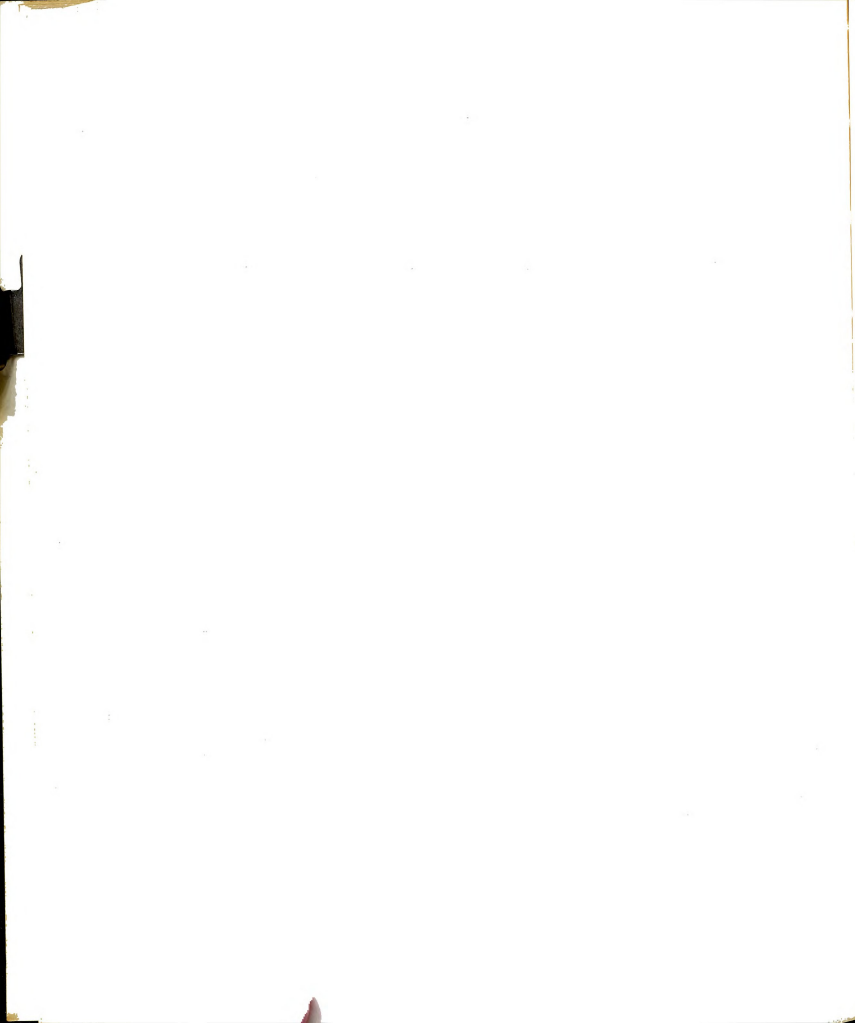
*Thirty-six percent of the total variance is accounted for by Factor β .



Each personality type was described along sixteen dimensions: the fourteen manifest needs scores, the attitude and dogmatism scores. To do this, weighted standard scores for each of the sixteen variables for each subject were computed. The higher the factor loading of a subject, the greater was the weight given to his raw score. These weighted values were summed across each variable separately and the arrays converted to standard scores. Tables 4.3 and 4.4 list the descending arrays of weighted scores for each variable on the first and the second personality types respectively.

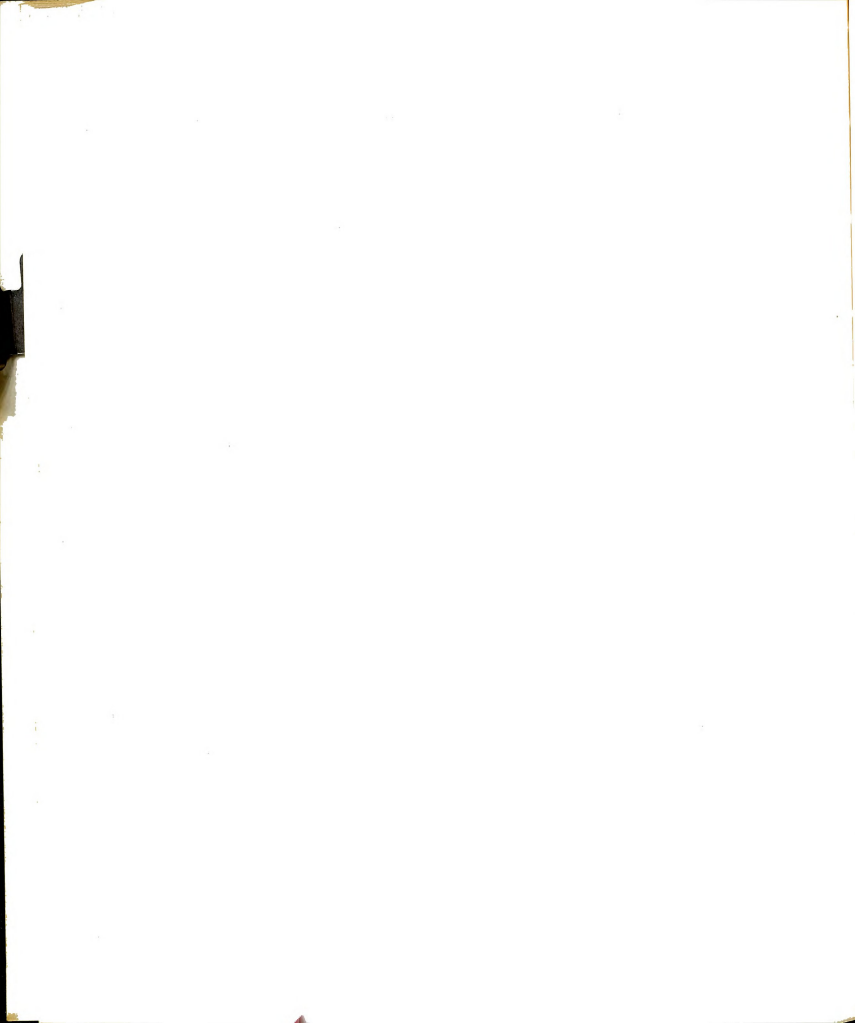
Table 4.3.--Descending Array of Standard Scores for Each of Sixteen Variables in the First Personality Type (Factor α).

Variable Description	Standard Score
Order	0.73
Aggression	0.58
Endurance	0.54
Autonomy	0.53
Deference	0.51
Succorance	0.49
Dominance	0.36
Exhibition	0.34
Achievement	0.28
Heterosexuality	0.26
Nurturance	0.24
Affiliation	0.22
Change	-0.01
Intracception	-0.02
Dogmatism	-1.89
MTAI	-3.16



Type I: The Self-
Centered Personality

Persons loading highest on Factor α manifested a very high need for aggression, whether by attacking contrary points of view, criticizing others, seeking revenge, or blaming others. These individuals had a high level of endurance, pushing themselves beyond the point of fruitful return. Though they needed to be quite autonomous they also could show deference to others: seeking suggestions, following instructions, giving praise, conforming to rules and regulations, accepting the leadership of others. Indirectly, deference expressed in the right place and at the right time could provide them with even greater autonomy. Help, comfort, kindness, sympathy, and affection from others was a strong need. On the other hand, these persons also needed to provide such services to others, at least to a greater extent than individuals of the second personality type. Related to these needs for succorance and nurturance was an expressed need for affiliation. Friends were needed to give comfort, kindness, and encouragement; to maintain these friends, some return of affection, sympathy and kindness had to be shown.



Individuals in this type didn't express a strong need for self analysis or perception of others' needs (intraception was low). These subjects needed to dominate others, to be the center of attraction more than persons of the second personality type. But the most significant factors may have been their level of open-mindedness and their attitudes toward children and their profession. While belief-systems were more open than closed, the sixty-two individuals in this personality type tended to be more closed-minded than persons of the second type. Furthermore, their attitudes weighed heavily on the negative end of the favorable-unfavorable continuum. Self-centeredness seemed to be a common factor in the interrelation of these variables, hence this personality type was designated as Self-Centered.

Table 4.4 presents the descending array of standard scores for the sixteen personality variables in the second personality type. Interpretation of the array follows the table.

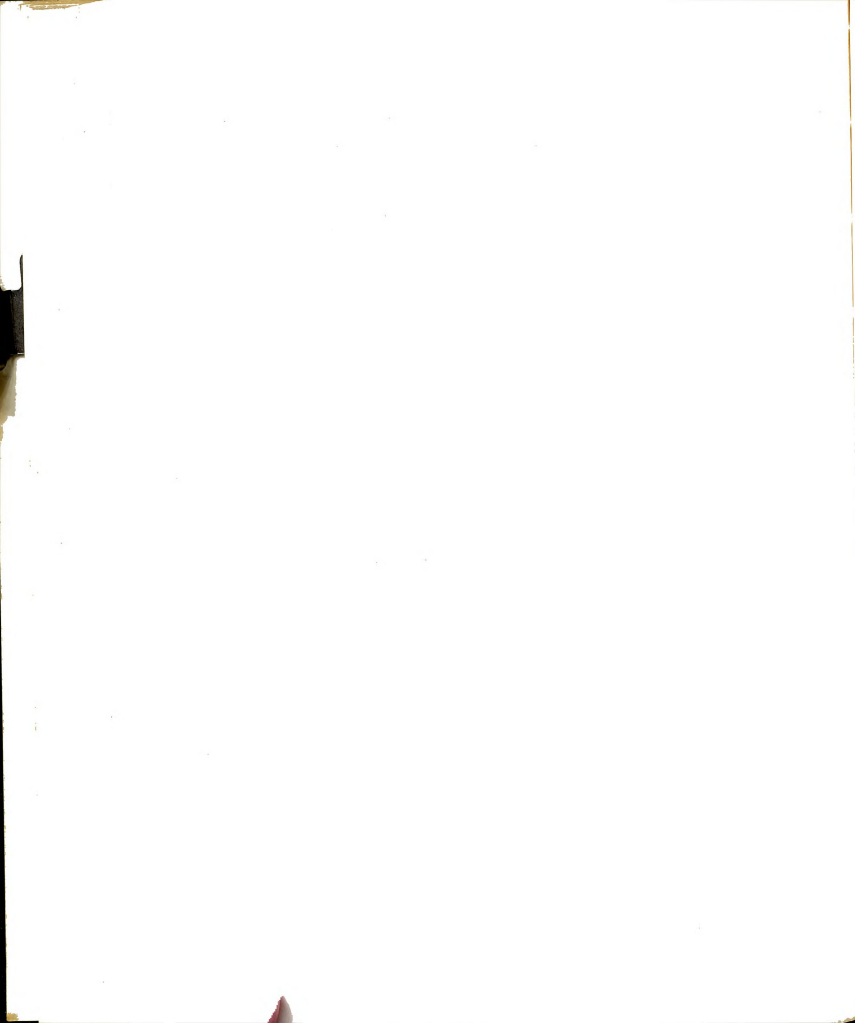
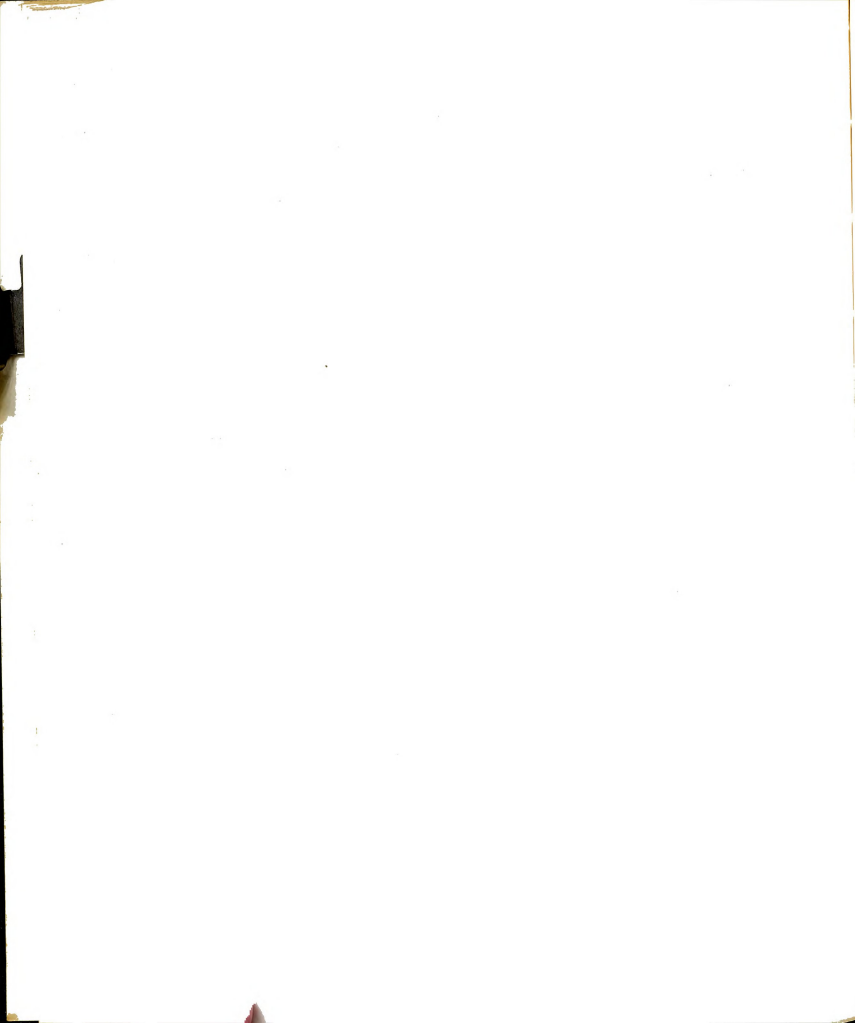


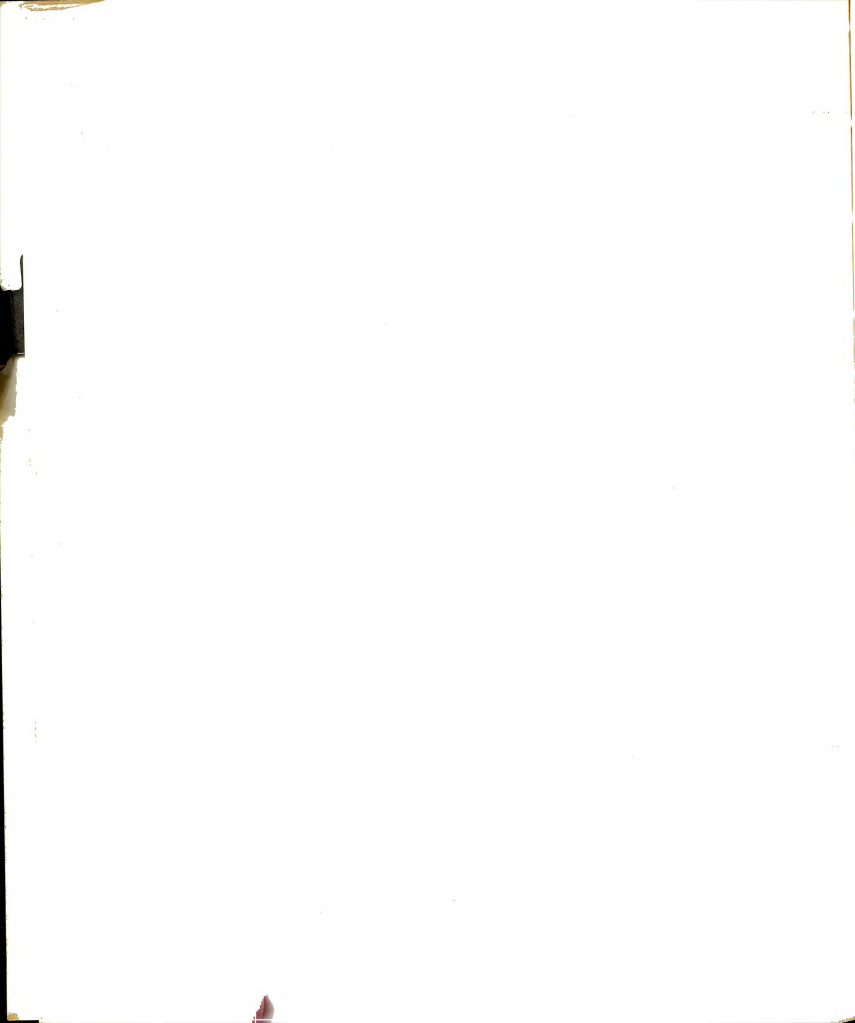
Table 4.4.--Descending Array of Standard Scores for Each of Sixteen Personality Variables in the Second Personality Type (Factor β).

Variable Description	Standard Score
MTAI	1.79
Heterosexuality	0.31
Achievement	0.28
Aggression	0.28
Deference	0.23
Dominance	0.22
Order	0.22
Autonomy	0.18
Exhibition	0.12
Succorance	0.08
Endurance	0.03
Change	0.02
Nurturance	-0.02
Intracception	-0.10
Affiliation	-0.15
Dogmatism	-3.51



Type II: The Well-
Integrated Personality

Individuals with highest loadings on Factor β expressed very positive attitudes toward children and teaching. Their belief-systems tended to be even more open than belief systems of the other sixty-two subjects. Heterosexual relations were slightly more important to the twenty-six persons of this type. They needed to achieve just as much as other individuals but expressed less need for autonomy, aggression, deference to others, or exhibition. These interns had a very low need for affiliation or attachment to friends. Consequently, praise, encouragement, sympathy, help, or understanding were not sought from others (low succorance); nor did they need personal fulfillment causing them to give affection or attention to others (low nurturance). They expressed less need for self-analysis or analysis of others' motives, feelings, and actions. They could let others direct their own destinies rather than predict their behaviors, categorize, or mold them. The common syndrome for this personality type seemed to be a well-integrated system of attitudes, needs, and beliefs.

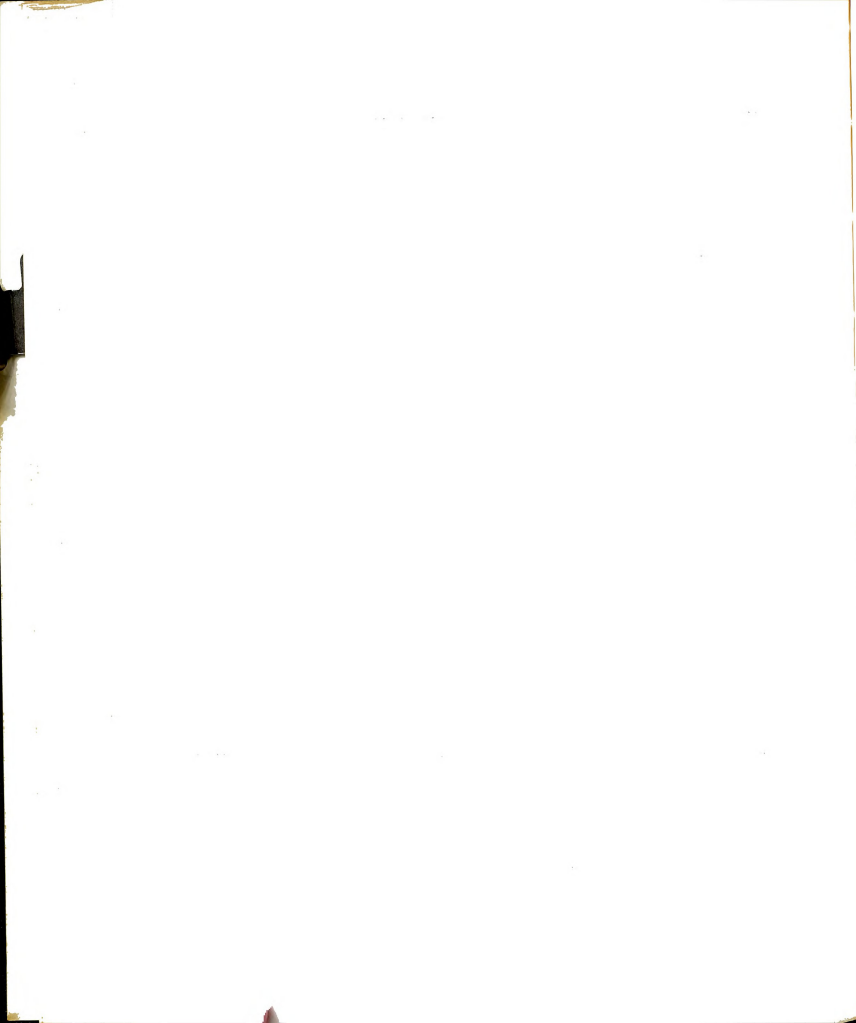


Hence, this second personality type was denoted the Well-Integrated Personality.

Table 4.5 includes the weighted standard score for each variable and the descending array of differences between personality types on a particular dimension. This array accents the distinguishing characteristics between the two types.

Table 4.5.--Descending Array of Differences Between Standard Scores for Each of Sixteen Personality Variables in Factors α and β .

Variable Description	Standard Score		Difference
	Factor α	Factor β	
Dogmatism	-1.89	-3.51	1.62
Endurance	0.54	0.03	0.51
Order	0.73	0.22	0.51
Succorance	0.49	0.08	0.41
Affiliation	0.22	-0.15	0.37
Autonomy	0.53	0.18	0.35
Aggression	0.58	0.28	0.30
Deference	0.51	0.23	0.28
Nurturance	0.24	-0.02	0.26
Exhibition	0.34	0.12	0.22
Dominance	0.36	0.22	0.14
Intracception	-0.02	-0.10	0.08
Achievement	0.28	0.28	0.00
Change	-0.01	0.02	-0.03
Heterosexuality	0.26	0.31	-0.05
MTAI	-3.16	1.79	-4.95



Subjects of the same personality type were assigned a plus one or a minus one (dependent variable) for each type. Regression or least squares was used to assign normalized weights to each of the sixteen independent variables indicating their contribution in accounting for the variation of the dependent variable (personality type) above that accounted for by its mean. Thus, relationships between personality type and the sixteen personality variables were estimated. The regression coefficients obtained from the eighty-eight subjects were used to predict personality types for the entire sample. One hundred thirty-two intern teachers (74.16%) were classified in the Self-Centered Personality Type and forty-six individuals were predicted to have Well-Integrated Personalities.

Classroom Learning Environments

Different classrooms present unique situations because teachers, children, time, and events vary. Even the same classroom is "new" each day because the people in it have had additional experiences. However, certain

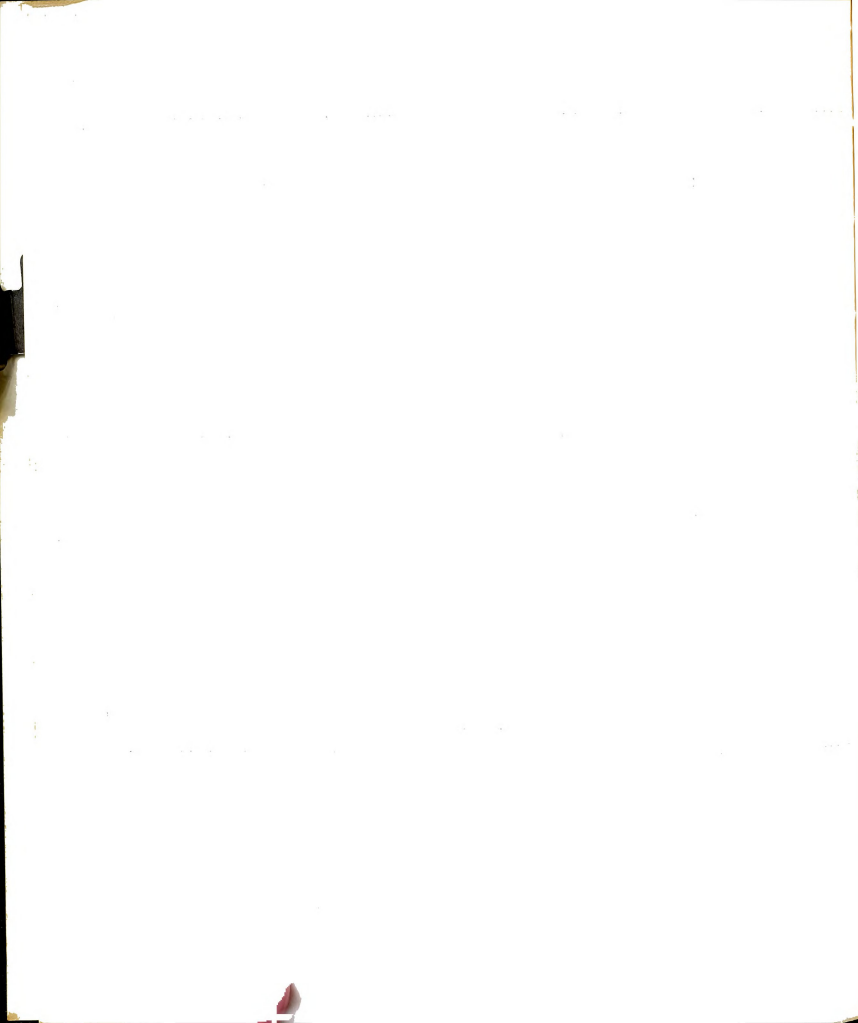


events commonly occur in elementary school classrooms: teacher and pupils interact; materials are used; groups form and separate. Researchers of teaching behaviors have developed a variety of observational techniques to facilitate their search for effective patterns of classroom behavior.² Individual behaviors which do not differentiate between teachers or classes are often combined into sets of behaviors or scales which do.³

Factor analysis, which accomplishes parsimonious and meaningful description of data, was used to suggest kinds of learning environments observed in intern teachers classrooms. Total scores from six observations of each of 178 elementary intern teachers on one hundred variables of the OSCAR III were intercorrelated. The resulting matrix was factor analyzed using a principal axis solution and varimax rotations. The fourth rotated solution was selected for further analysis after considering:

² Simon and Boyer, Mirrors for Behavior.

³ Medley and Mitzel, "Measuring Classroom Behavior by Systematic Observation," 308-309.



1. The size of the eigenvalues;
2. The proportion of total variance explained by each factor; and,
3. The conceptual meaningfulness of the factors implied by the variables loading on each factor.

Not all variables having significant loadings on a factor are reported in Tables 4.6 through 4.10. If the highest loading approached or exceeded .40, the variable was listed in the table; however, all variable loadings were used in computing the factor scores for each subject.⁴ In addition to the highest loadings, the second highest correlation, its related factor, and the communality for the variable are reported.

Dimension I: Supportive
Learning Environment

The first dimension of classroom behaviors (reported in Table 4.6) manifested an atmosphere of mutual

⁴Variable loadings for the Fourth Rotated Solution and their communalities are listed in Appendix E.



support: teachers supported pupils, pupils supported the teacher and each other. The teacher engaged in a variety of activities: demonstrations and use of a variety of teaching aids. She was observed praising the good behavior of children and also "talking to the class." This category included reproofing remarks of the teacher regarding pupil behaviors. Pupils demonstrated affection for both the teacher and other pupils, used a variety of learning aids rather than the textbook and were employed in art-related activities.

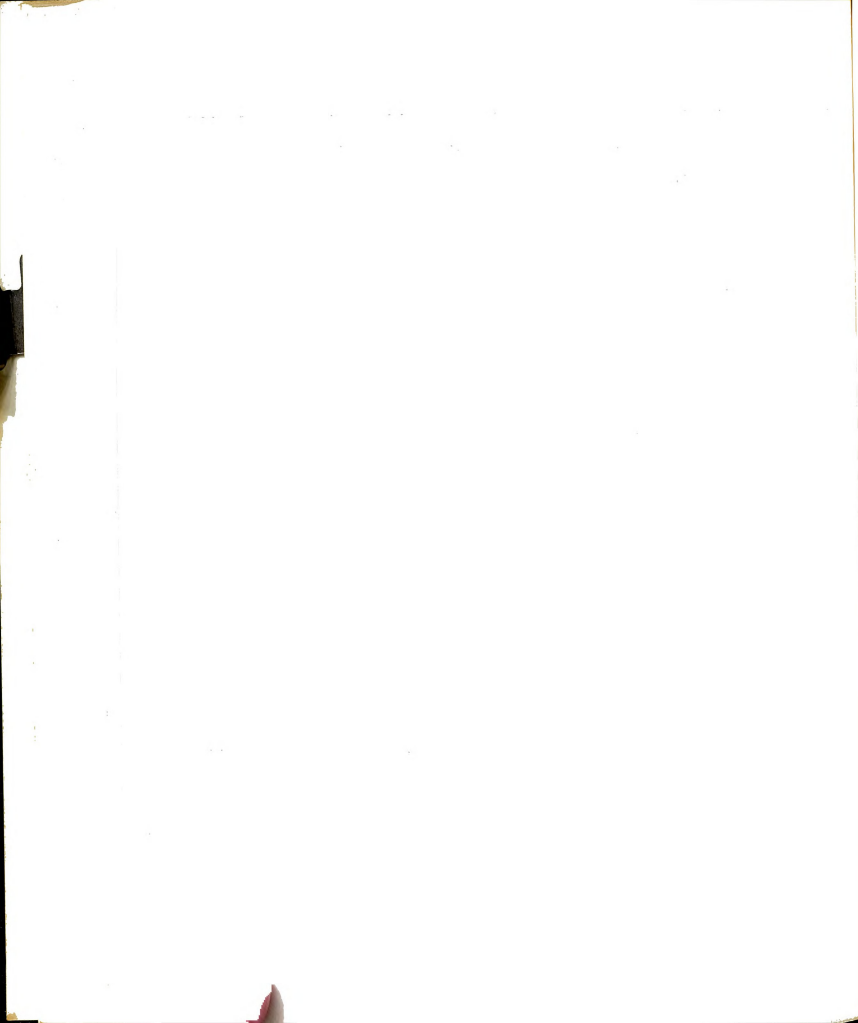
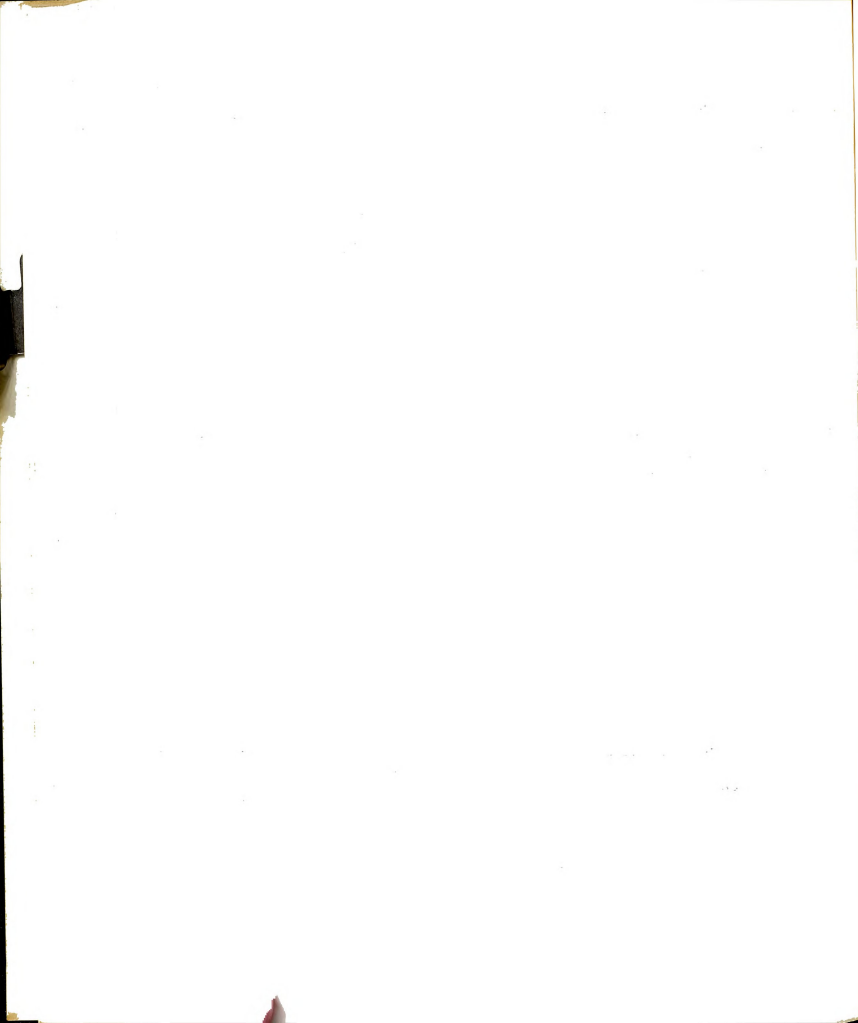


Table 4.6.--Variables Loading Highest on Factor I (Supportive Learning Environment).*

Variable Number and Name	Highest Loadings		Related Factor	h ²
	First	Second		
15 Teacher demonstrates	694	-186	V	538
97 Subject: art, crafts	587	-234	IV	447
73 Teacher uses three dimensional object	579	154	IV	370
29 Pupil shows affection to teacher	576	163	IV	388
51 Pupil shows affection to pupil	553	-244	II	383
84 Pupil uses three dimensional object	536	-145	II	343
70 Teacher uses map, chart, picture	524	147	II	325
85 Pupil uses text, workbook	-506	412	II	559
77 Teacher uses handi-craft, art materials	488	-186	IV	307
8 Teacher praises good behavior	479	-084	III	239
43 Pupil paints, cuts, draws	459	363	III	460
37 Pupil plays game	450	-166	V	240
88 Pupil uses handi-craft, art materials	445	-340	IV	447
18 Teacher leads singing, exercises, games	437	-238	V	299
14 Teacher illustrates with map, chart	407	226	II	230
12 Teacher talks to class	393	236	III	267

*Seven percent of the variance is accounted for by Factor I.



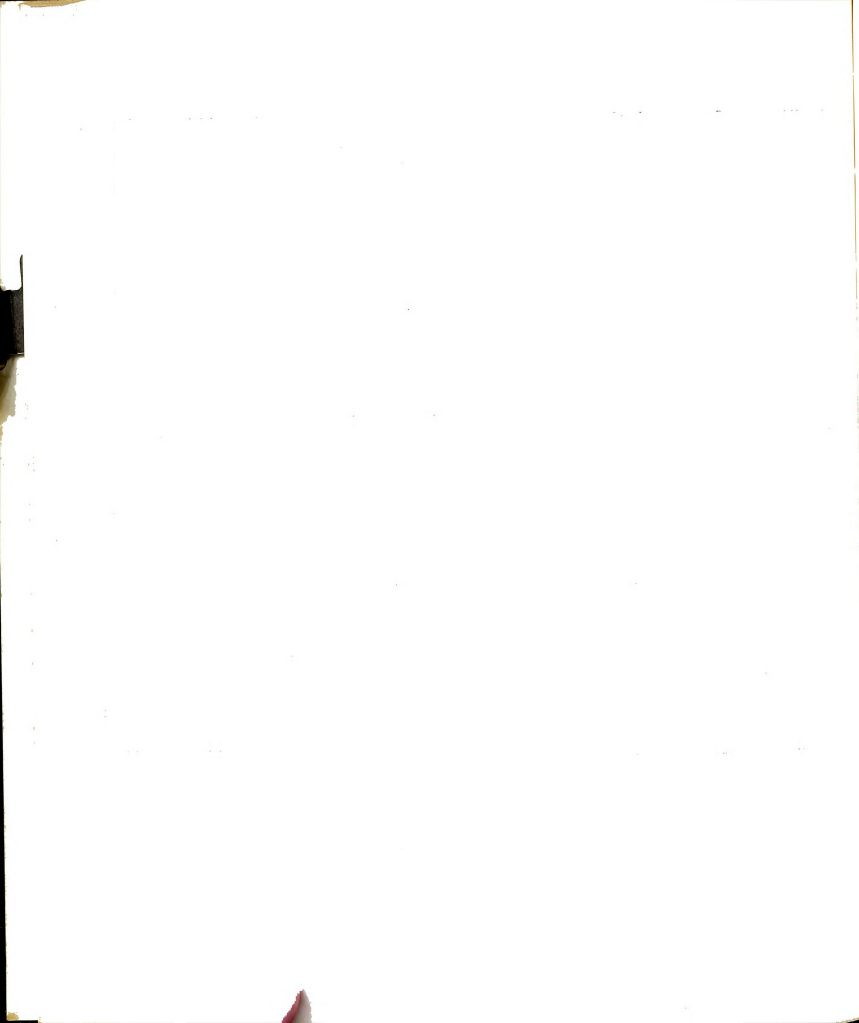
Dimension II: Conventional
Learning Environment

Table 4.7 indicates the variables loading highest on Factor II. Traditional classroom activities were tapped in the second dimension. The teacher led the class by illustrating at the chalkboard and asking questions. Text, workbook, and chalkboard were the teaching aids utilized. Only two pupil activities loaded highest on this factor: reading aloud and using the chalkboard. This stereotype of a classroom was designated as a Conventional Learning Environment.

Table 4.7.--Variables Loading Highest on Factor II (Conventional Learning Environment).*

Variable Number and Name	Highest Loadings		Related Factor	r^2
	First	Second		
13 Teacher illustrates at board	634	-093	IV	414
33 Pupil reads aloud	621	-160	IV	457
69 Teacher uses chalkboard	613	-186	IV	433
79 No materials used by teacher	-612	178	III	442
74 Teacher uses text, workbook	611	-448	I	600
1 Teacher questions, pupil answers	607	346	I	564
80 Pupil uses chalkboard	490	-185	IV	303

*Five percent of the total variance is accounted for by Factor II.



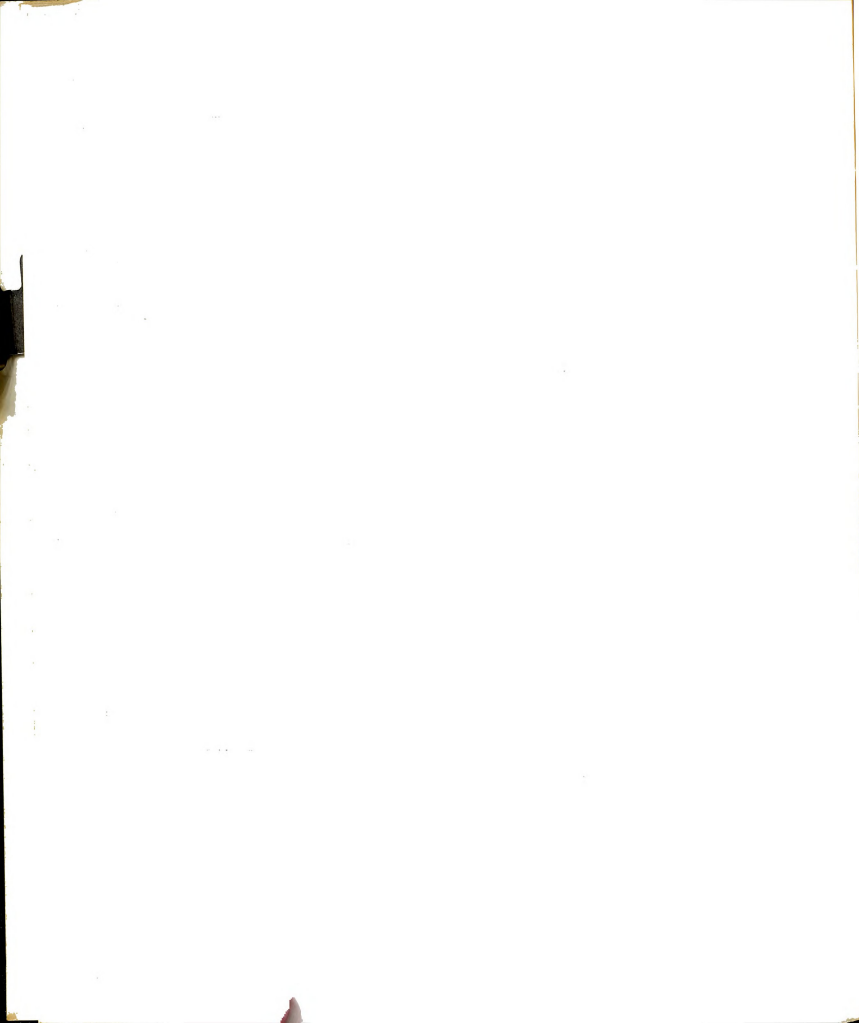
Dimension III: Independent Learning Environment

Independence of pupils is strongly indicated by Factor III, the highest loadings of which are shown in Table 4.8. The teacher engaged in small group tasks while the majority of children pursued private study. Less than half the class worked with the teacher. Teacher assistance was given to individual pupils or their questions were answered. This dimension was named Independent Learning Environment.

Table 4.8.--Variables Loading Highest on Factor III (Independent Learning Environment).*

Variable Number and Name	Highest Loadings		Related Factor	h^2
	First	Second		
86 Pupil uses supplementary reading material	641	-120	IV	432
41 Pupil reads, studies at desk	613	-148	I	421
42 Pupil writes, manipulates at desk	591	234	II	469
87 Pupil uses writing material	584	273	II	429
60 Over one half the class in group task with teacher	-568	099	I	344
9 Teacher works with individual pupil	561	325	I	456
2 Teacher answers pupil's question	540	453	IV	527
63 Over one half the class in individual task without teacher	467	-227	IV	280

*Five percent of the total variance is accounted for by Factor III.



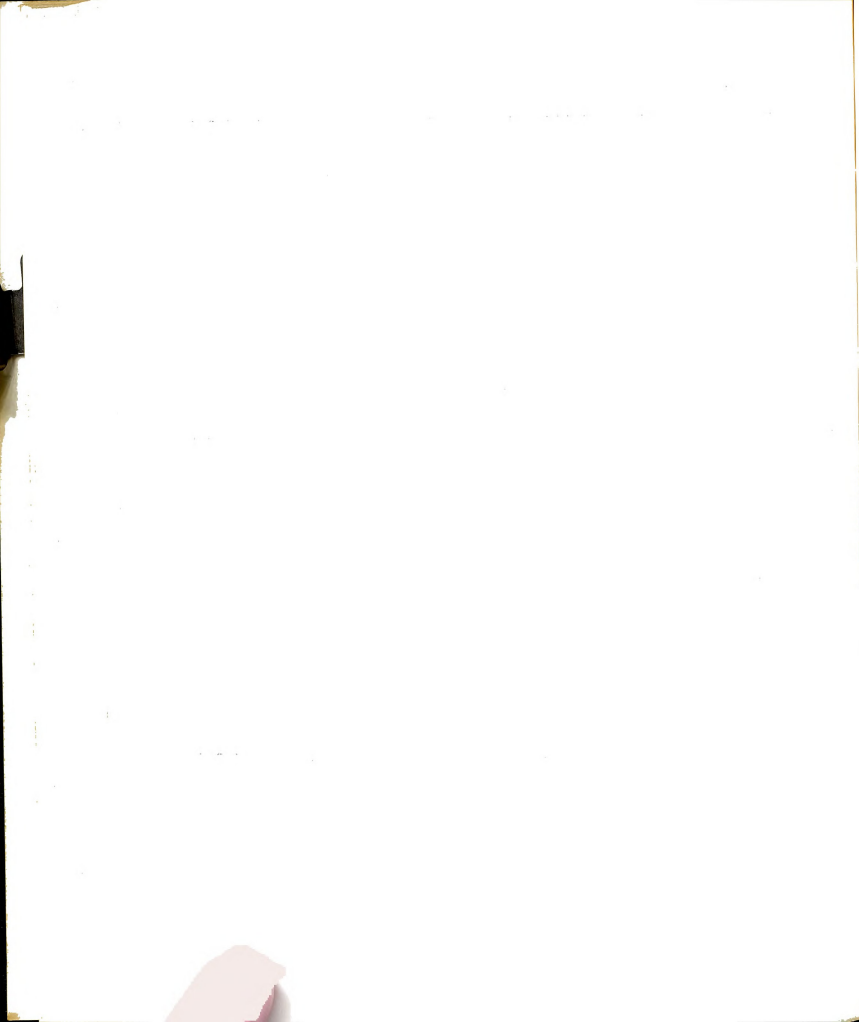
Dimension IV: Enriched
Learning Environment

Variables loading on Factor IV, reported in Table 4.9, appear to be unconventional and somewhat supportive if the second highest loadings are inspected. The teacher utilized some audiovisual aid during a science lesson or the pupil assumed the role of director of learning by demonstrating or using a special aid. Active learning on the part of the pupil left little time for whispering that was not related to learning. Seven variables loading highest on this factor plus other significant correlations not indicated here characterized an Enriched Learning Environment.

Table 4.9.--Variables Loading Highest on Factor IV (Enriched Learning Environment).*

Variable Number and Name	Highest Loadings		Related Factor	h ²
	First	Second		
95 Subject: science	503	-073	II	262
91 Subject: reading	-497	319	II	425
89 Pupil uses special learning aid	489	192	I	338
34 Pupil demonstrates, illustrates	466	357	I	401
24 Pupil whispers	-460	376	V	404
71 Teacher uses slides, film	460	-224	III	290
16 Teacher shows film, slide	431	-215	III	244

*Four percent of the total variance is accounted for by Factor IV.



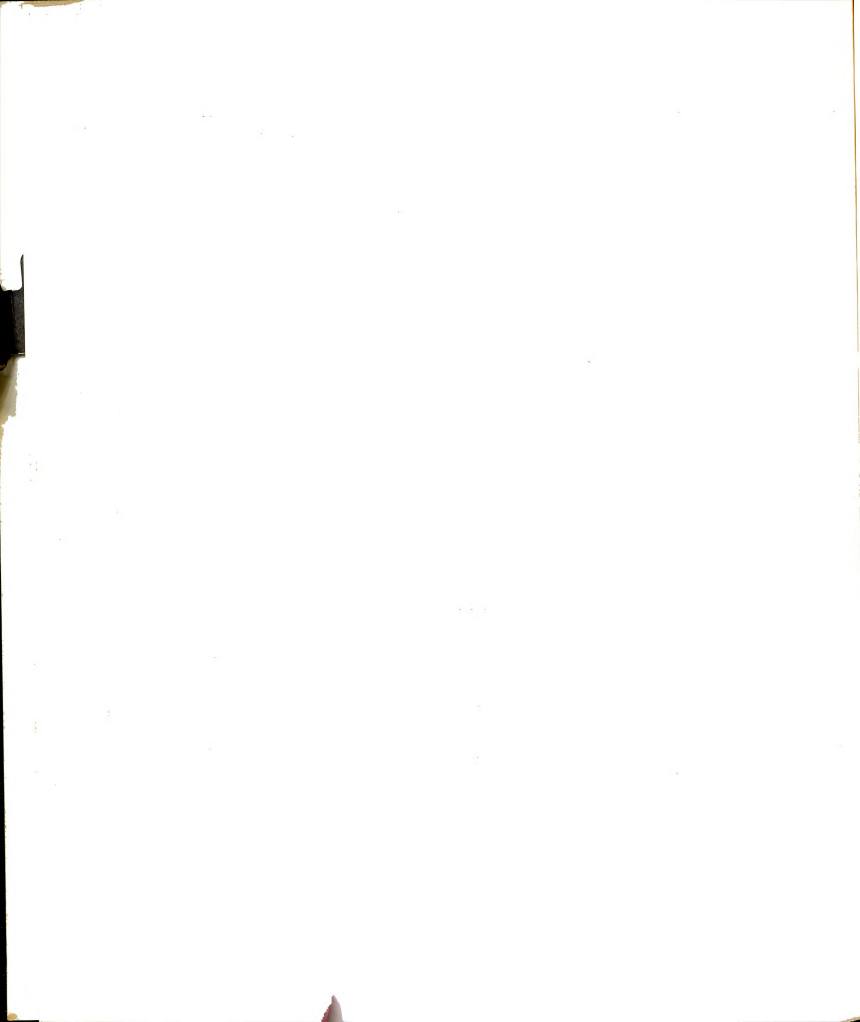
Dimension V: Hostile
Learning Environment

A negatively charged emotional climate is described by the set of variables loading highest on the fifth factor. Pupils showed hostility to each other and to the teacher, interrupted the teacher or ignored questions. On the other hand, the teacher also manifested hostility to pupils, ignored their questions, criticized or was sarcastic, warned or threatened the pupils. This dimension was denoted a Hostile Learning Environment.

Table 4.10.--Variables Loading Highest on Factor V (Hostile Learning Environment).*

Variable Number and Name	Highest Loadings		Related Factor	h ²
	First	Second		
26 Pupil interrupts teacher	667	145	II	498
50 Pupil shows hostility to pupil	577	173	I	395
28 Pupil shows hostility to teacher	557	-238	I	380
4 Teacher ignores pupil's question	489	184	III	286
27 Pupil ignores teacher's question	487	-132	II	287
6 Teacher criticizes, uses sarcasm	485	-216	I	302
49 Pupil scuffles, fights with pupil	448	-291	II	311
3 Teacher interrupts pupil	442	100	II	213
22 Teacher leaves, enters room	404	-246	II	266
5 Teacher warns, threatens pupil	399	-236	I	285

*Four percent of the total variance is accounted for by Factor V.



Summary

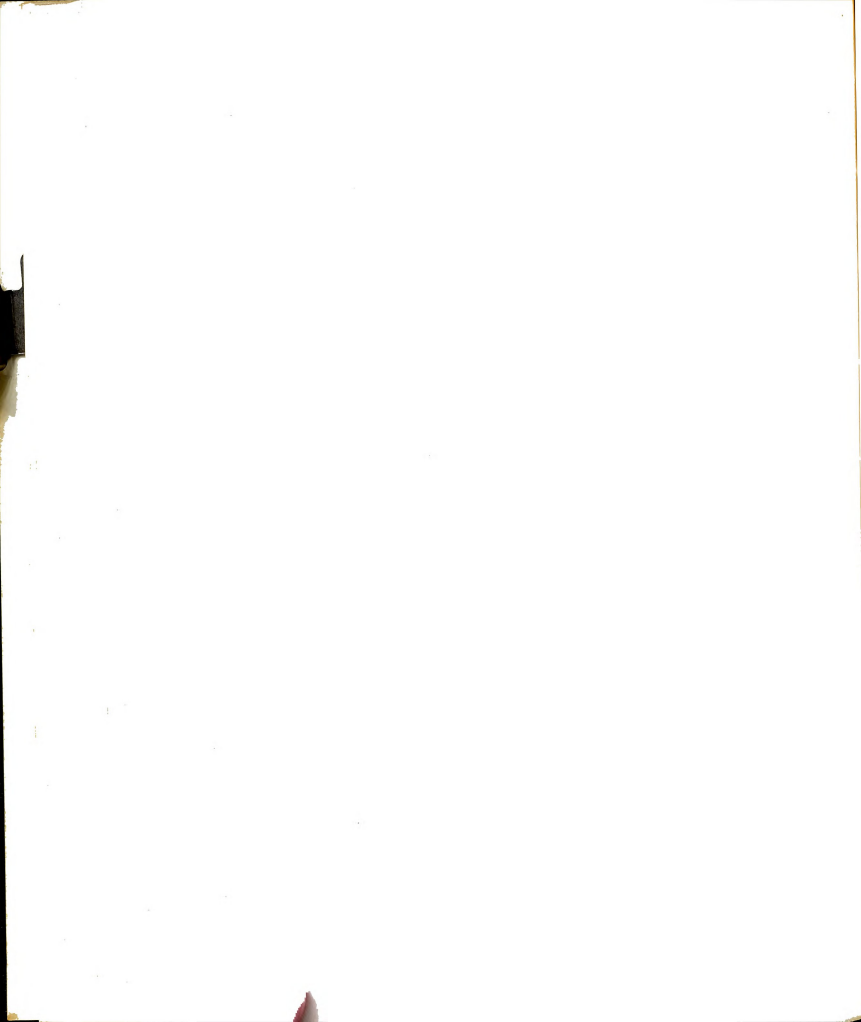
Factor analysis provided answers to two major questions posed for study. First, personality types were identified by investigating prospective teachers' patterns of response to paper-pencil inventories. The two types found in this research were designated the Self-Centered and the Well-Integrated Personalities. Second, distinct learning environments were observed in the elementary school classrooms of these teachers. Conceptual names given to the learning environments were: Supportive, Conventional, Independent, Enriched, and Hostile.



CHAPTER V
RESULTS OF MULTIVARIATE ANALYSIS
OF VARIANCE

Introduction

Factor analysis provided a parsimonious description of personality and classroom behavior variables: two personality types were identified from sixteen personality scores and five learning environments were constructed from one hundred categories of overt classroom behaviors. Results of these analyses posed a question regarding the relationships between certain independent variables such as personality type, sex, and teaching levels, and the five learning environments observed in an elementary school classroom. A five-variate multivariate analysis of variance was performed using mean scores of (1) personality type by sex, and (2) sex by teaching levels. Significant findings were further investigated using post hoc comparisons. The findings are reported in this chapter.



Personality Types and Sex Related to
Five Learning Environments

To determine the nature of differences (if any) in learning environments among male and female elementary intern teachers of two personality types, a five-variate multivariate analysis of variance was employed. Subjects were classified both by personality type and sex. Subclass frequencies for the design are shown in Table 5.1.

Table 5.1.--Subclass Frequencies of Male and Female Elementary Intern Teachers in Two Personality Types.

Personality Type	Sex		Total
	Male	Female	
Self-Centered	20	112	132
Well-Integrated	11	35	46
Total	31	147	178

The statistical hypotheses posed and tested were:

Hypothesis One: There is no difference in learning environments between teachers identified as having Self-Centered or Well-Integrated Personalities.

Hypothesis Two: There is no difference in learning environments between classes taught by male or female elementary intern teachers.



Hypothesis Three: There is no difference in learning environments between classes taught by male or female elementary intern teachers identified as having Self-Centered or Well-Integrated Personalities.

Results of the multivariate test are presented in the next four tables. Mean product matrices are shown in Table 5.2; the overall tests of significance for personality type, sex, and interaction are exhibited in Table 5.3.

Table 5.2.--Mean Products: Multivariate Analysis of Variance of Learning Environments for Personality Types by Sex.

M_T :	Between personality types						df = 1
S	1.182						0.145
C	-0.374	0.118					
I	-1.888	0.598	3.015				
E	-0.678	0.215	1.083	0.389			
H	-0.414	0.131	0.661	0.237			
M_S :	Between sexes						df = 1
S	1.602						1.253
C	3.483	7.568					
I	-1.039	-2.258	0.674				
E	3.444	7.485	-2.234	7.404			
H	-1.417	-3.080	0.919	-3.046			
M_{TS} :	Interaction						df = 1
S	0.000						0.372
C	-0.005	0.142					
I	-0.002	0.040	0.011				
E	0.020	-0.511	-0.145	1.844			
H	0.009	-0.230	-0.065	0.829			
M_e :	Within-cell						df = 174
S	0.999						1.013
C	-0.259	0.986					
I	0.020	0.196	1.009				
E	-0.268	0.188	0.104	0.954			
H	-0.290	0.183	0.079	0.292			

S: Supportive
E: Enriched

C: Conventional
H: Hostile

I: Independent



Matrices of personality type and interaction (Table 5.2) show a structure similar to that of the residual covariance matrix (error term). Neither personality type nor interaction of personality type and sex was significant, as the overall test results indicate (Table 5.3).

Table 5.3.--Tests of Significance in Multivariate Analysis of Variance for Two Personality Types of Male and Female Elementary Intern Teachers.

	Effect		
	Type	Sex	Interaction
p = 5*			
n_h #	1	1	1
n_e †	174	174	174
F	0.826	5.119	0.508
df	5 and 170	5 and 170	5, 170
prob.	p < 0.5327	p < 0.0003	p < 0.7701

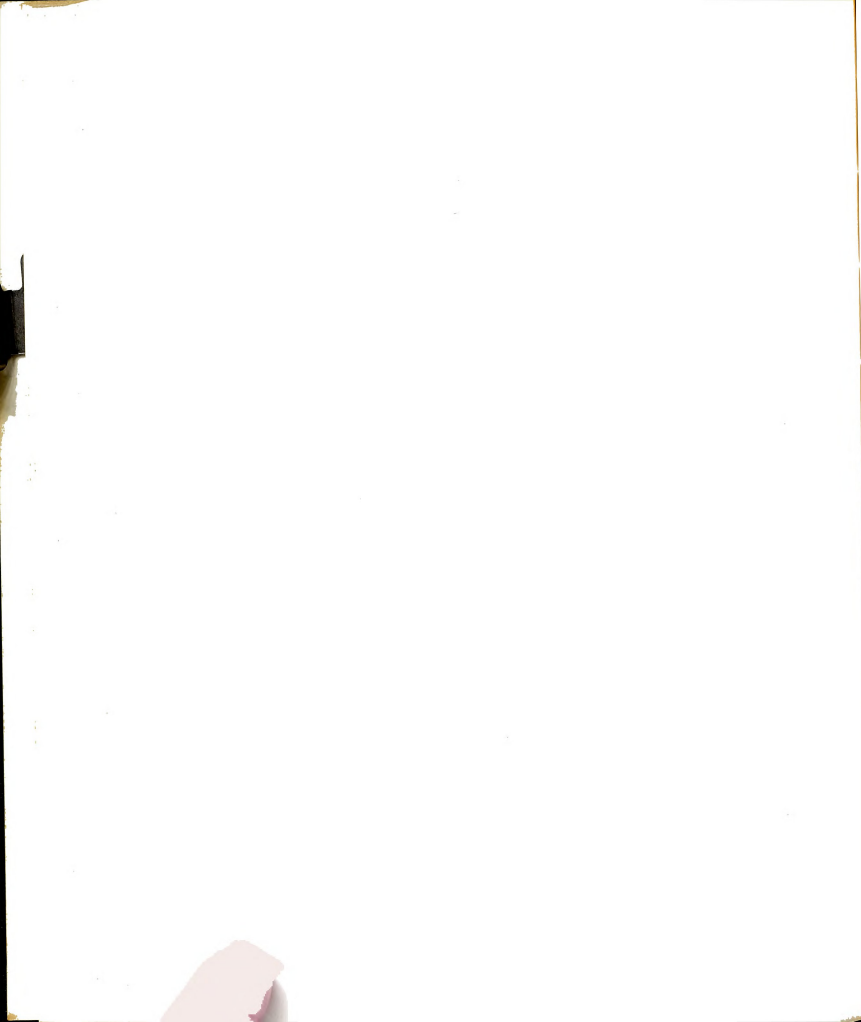
Discriminant function, sex:

$$V_S = -0.498_S - 0.674_C + 0.325_I - 0.715_E + 0.376_H$$

*p equals the number of dependent variables: Supportive, Conventional, Independent, Enriched, Hostile.

#degrees of freedom associated with M_h , or the matrix of mean products for a classification variable or an interaction.

†degrees of freedom associated with M_e , or a p x p matrix of error mean products.



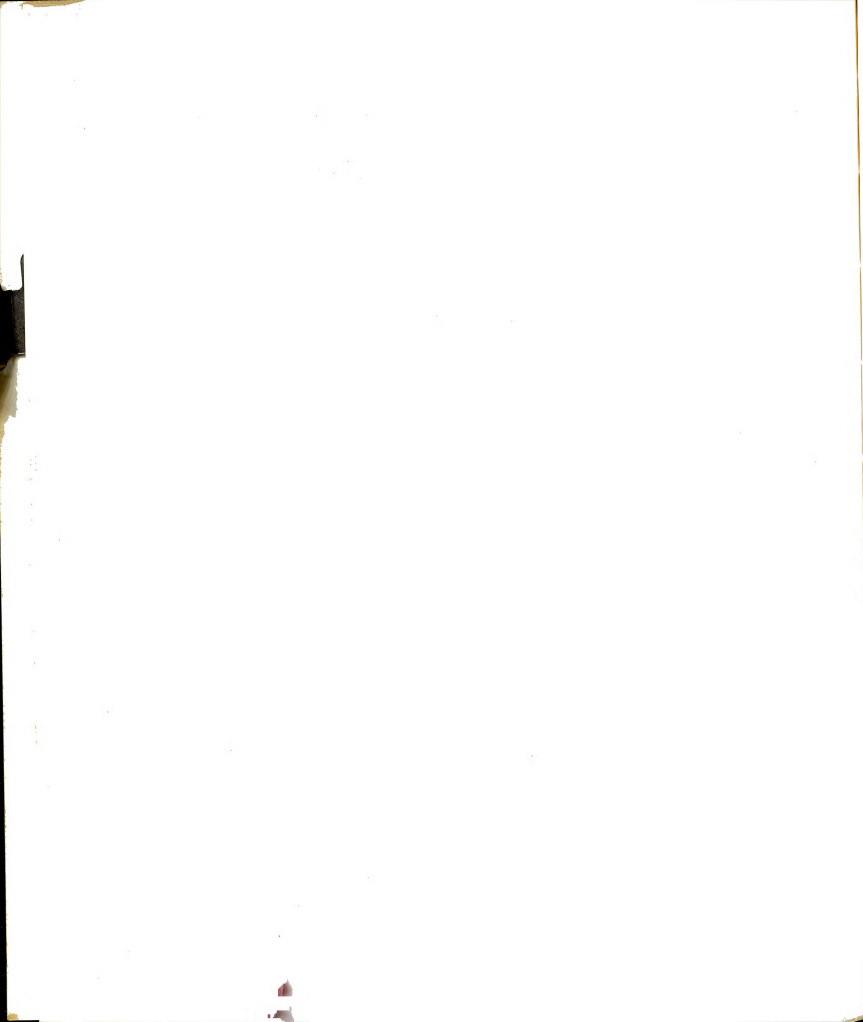
Results of the multivariate test indicate that only one hypothesis was supported at the chosen level of significance (.05).

Hypothesis One: There is no difference in learning environments between teachers identified as having Self-Centered or Well-Integrated Personalities. Fail to reject.

Hypothesis Two: There is no difference in learning environments between classes taught by male or female elementary intern teachers. Reject
($p < .01$)

Hypothesis Three: There is no difference in learning environments between classes taught by male or female elementary intern teachers identified as having Self-Centered or Well-Integrated Personalities. Fail to reject.

No significant differences were found between teachers classified as Self-Centered or Well-Integrated in their style of teaching. The teaching environments of males were significantly different from those of females. Male teachers were observed in more Supportive



(.234 versus -.037), Conventional (.442 versus -.092), and Enriched (.416 versus -.107) learning environments, while females were seen in more Independent and Hostile classroom settings. When the interaction of sex and personality type (Hypothesis Three) was analyzed, no significant differences were observed beyond those attributable to sex. Means for these variables are presented in Table 5.4. Figure 5.1 graphically describes these differences. Figure 5.1 illustrates, too, that females tended toward less variability in learning environments observed in their classrooms.

Table 5.4.--Subclass Means of Male and Female Elementary Intern Teachers in Two Personality Types.

Sex	Learning Environment	Personality Type		Means
		Self-Centered	Well-Integrated	
Male	Supportive	0.174	0.343	0.234
	Conventional	0.524	0.292	0.442
	Independent	-0.047	-0.366	-0.160
	Enriched	0.310	0.608	0.416
	Hostile	-0.254	-0.096	-0.198
Female	Supportive	-0.075	0.087	-0.037
	Conventional	-0.075	-0.148	-0.092
	Independent	0.101	-0.173	0.036
	Enriched	-0.042	-0.316	-0.107
	Hostile	0.053	-0.047	0.030
Means	Supportive	-0.037	0.148	0.011
	Conventional	0.016	-0.043	0.001
	Independent	0.079	-0.219	0.002
	Enriched	0.083	-0.095	0.037
	Hostile	0.006	-0.059	0.011



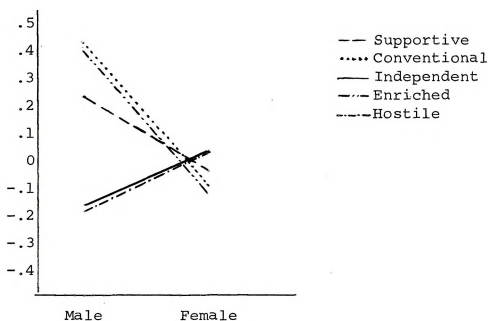
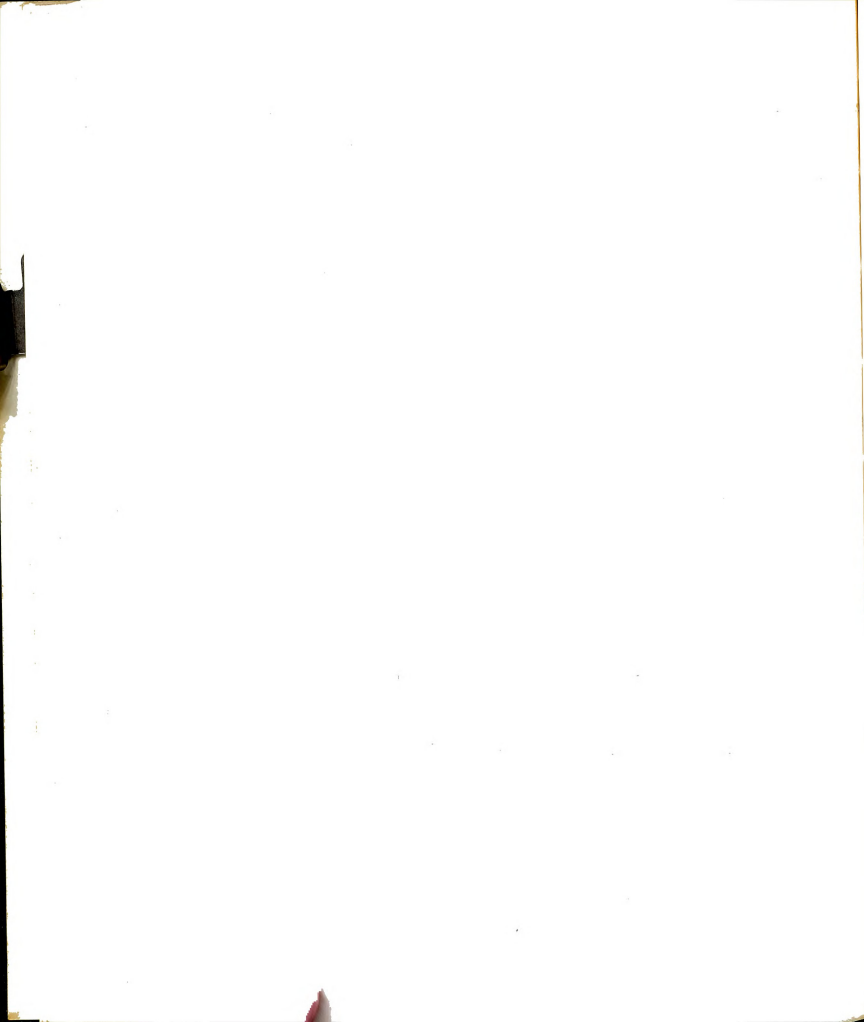


Figure 5.1.--Comparison of Overall Means for Male and Female Elementary Intern Teachers on Each of the Learning Environments.

To further investigate the source of differences, the linear function of the dependent variates which maximally discriminates between sexes was computed. The discriminant function, for which coefficients are provided by the latent vector associated with the significant latent root for sex effect, was as follows:

$$V_{\text{sex}} = -0.498_S - 0.674_C + 0.325_I - 0.715_E + 0.376_H$$

Learning environments contributing the most to the function had negative weights: Enriched, Conventional, and



Supportive. Mean scores for males were higher on each of these dimensions.

To support the previously computed analyses the step-down F test was employed. The results of this test are exhibited in Table 5.5. In this test, the investigator usually orders dependent variables and critical values according to his priority of interest. Order of the dependent variables was established by the successive extraction of each factor in the factor analysis. Almost equal amounts of variance were accounted for by each factor, thus justifying use of equal α levels for each dependent variable. The sum of the α levels for the dependent variables equals the chosen fiducial level for the overall test of significance (.05). Conventional and Enriched learning environments (the same dependent variables contributing the most weight to the discriminant function) were significant step-down F statistics, and thus accounted for the major differences between male and female intern teachers.

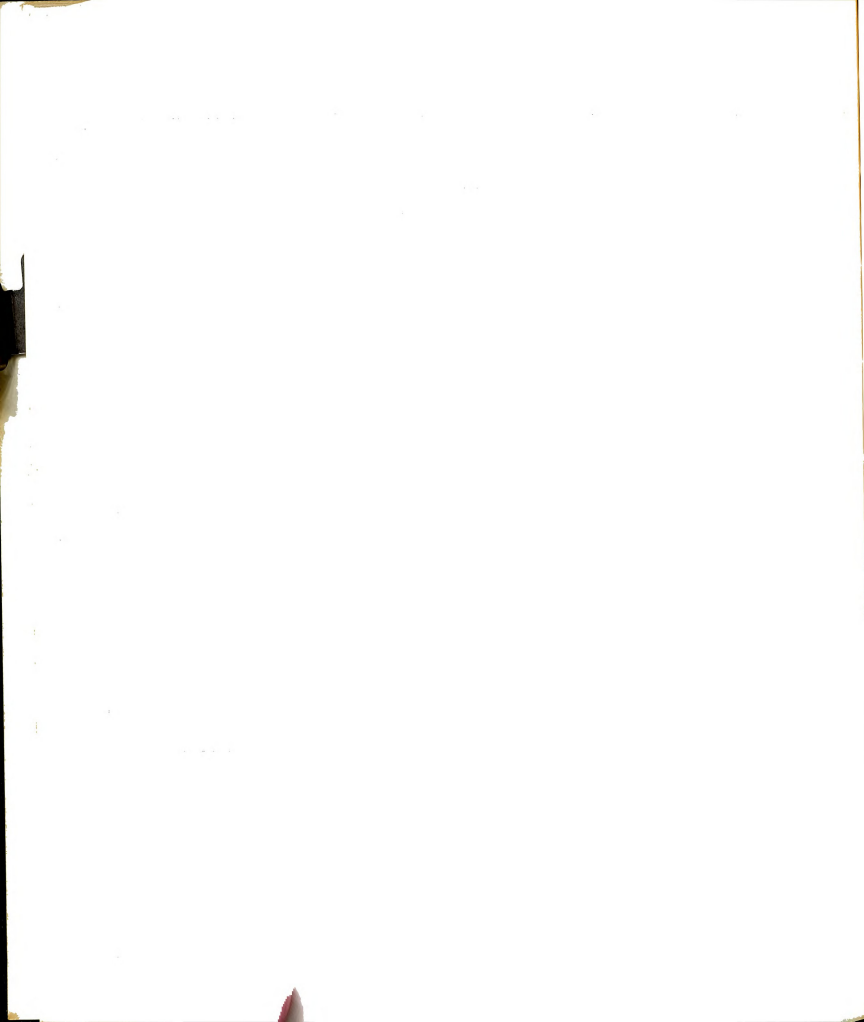
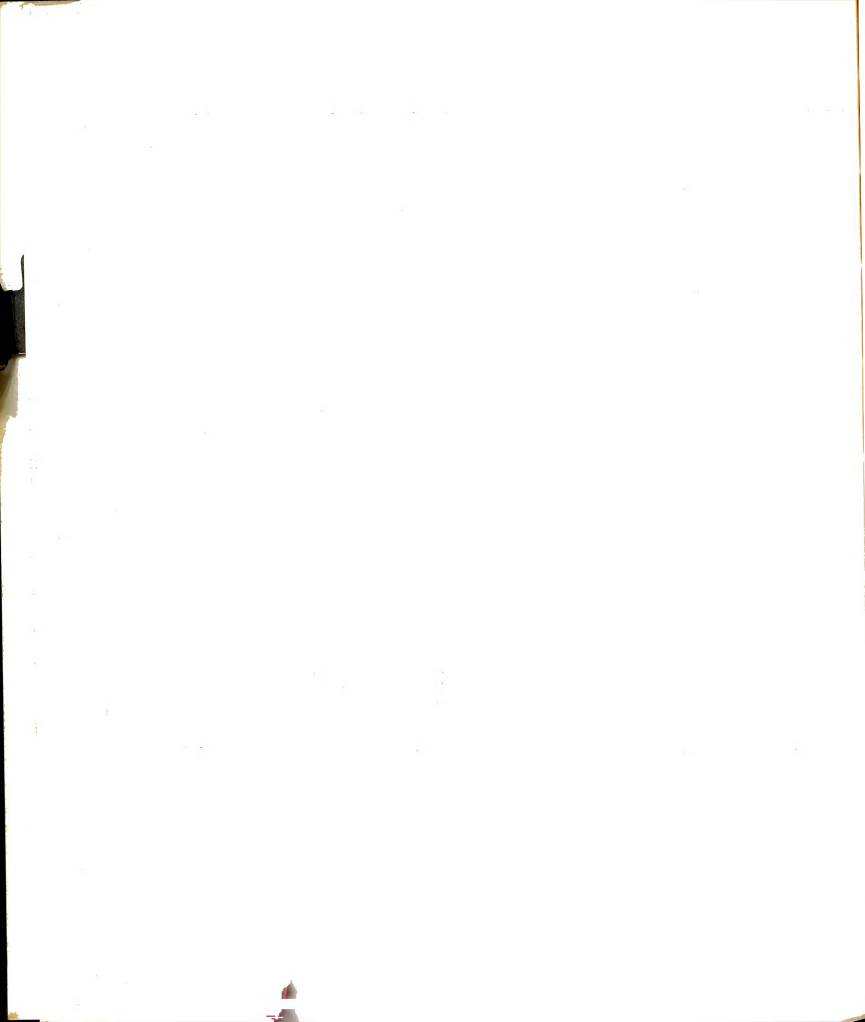


Table 5.5.--Step-down Test of Sex Effect.

Learning Environments	Univariate F	Degrees of freedom	Step-down F	Degrees of freedom	α
Supportive	1.60	1/174	1.60	1/174	.01
Conventional	7.68	1/174	10.16	1/173	.01*
Independent	0.67	1/174	1.97	1/172	.01
Enriched	7.76	1/174	8.12	1/171	.01*
Hostile	1.24	1/174	2.77	1/170	.01

*Significant beyond .01 level. Critical value for 1/120 degrees of freedom is 6.85.



Teaching Level Related to Five
Learning Environments

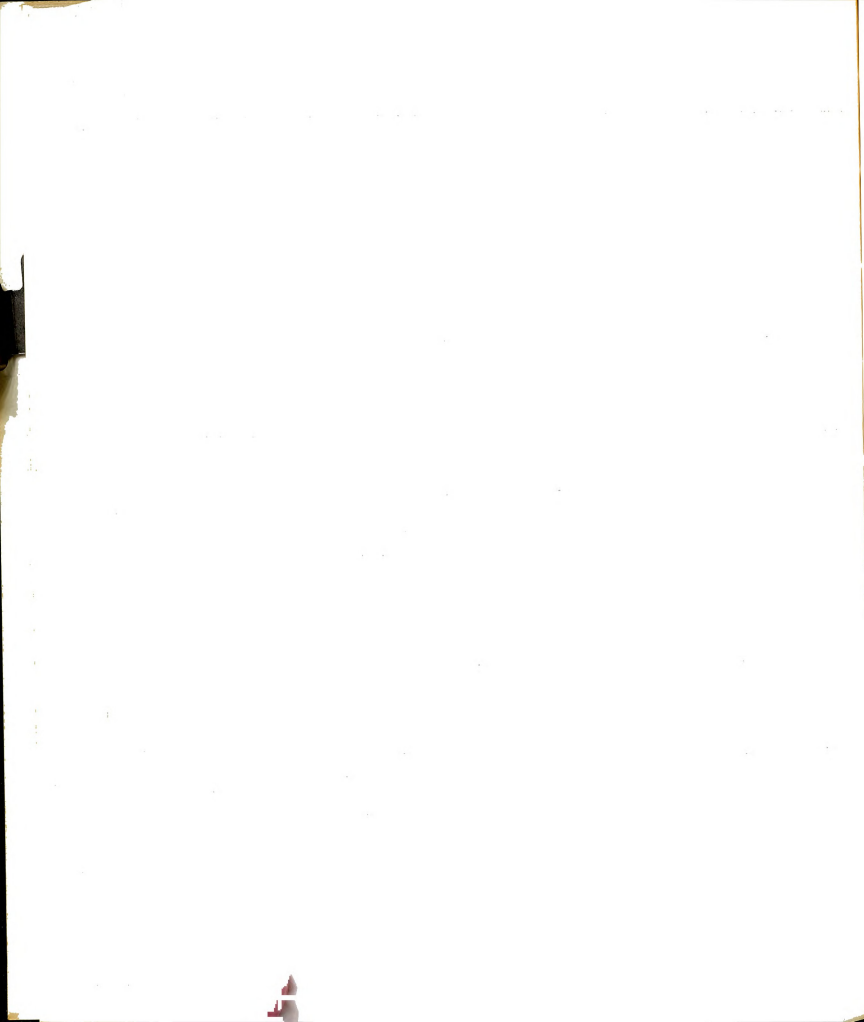
The same five-variate multivariate analysis of variance was utilized to determine the nature of differences (if any) in learning environments among male and female elementary intern teachers at four teaching levels: K-2, 3-5, 6-8, and Special Education. Subclass frequencies for the 2 x 4 design are provided in Table 5.6.

Table 5.6.--Subclass Frequencies of Male and Female Elementary Intern Teachers at Four Teaching Levels.

Sex	Teaching Levels				Total
	K-2	3-5	6-8	Spec. Ed.	
Male	1	13	14	3	31
Female	71	56	13	7	147
Total	72	69	27	10	178

Two statistical hypotheses were posed and tested:

Hypothesis Four: There is no difference in learning environments among classes in teaching levels K-2, 3-5, 6-8, and Special Education.



Hypothesis Five: There is no difference in learning environments between classes taught by male and female elementary intern teachers at teaching levels K-2, 3-5, 6-8, and Special Education.

Results of the multivariate analysis of variance for mean vectors (shown in Tables 5.7 and 5.8) indicate that both main effects were significant at greater than the .01 level of confidence. The mean products (Table 5.7) between the four teaching levels on each dependent variable show a pattern of differences counter to the structure of the within-cells covariance matrix (M_e). Differences lay in both the size and sign of variance and covariance coefficients.



Table 5.7.--Mean Products: Multivariate Analysis of Variance of Learning Environments for Sex by Teaching Level.

M_S : Between sexes		df = 1			
S	1.875				
C	3.700	7.301			
I	-1.395	-2.618	0.985		
E	3.621	7.144	-2.624	6.991	
H	-1.578	-3.113	1.143	-3.046	1.328
M_L : Between teaching levels		df = 3			
S	13.448				
C	-1.517	0.429			
I	-2.773	0.258	0.687		
E	-1.031	1.459	-0.584	9.601	
H	-5.778	0.679	1.089	1.060	2.575
M_{SL} : Interaction		df = 3			
S	0.540				
C	0.073	0.314			
I	-0.907	0.317	2.359		
E	0.038	0.237	0.371	0.229	
H	-0.289	-0.538	-0.343	-0.453	1.029
M_e : Within-cells		df = 170			
S	0.781				
C	-0.243	0.999			
I	0.036	0.197	0.995		
E	-0.262	0.163	0.118	0.819	
H	-0.192	0.184	0.073	0.485	0.976

S: Supportive
E: Enriched

C: Conventional
H: Hostile

I: Independent

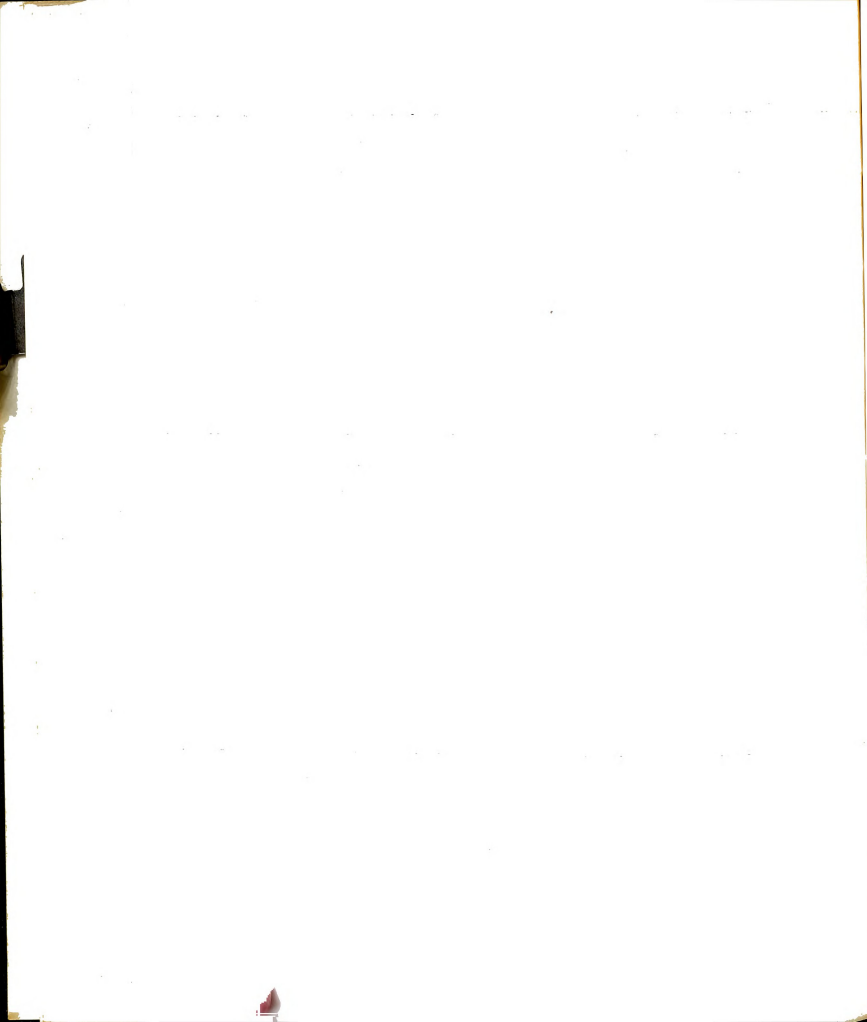


Table 5.8.--Tests of Significance in Multivariate Analysis of Variance for Male and Female Elementary Intern Teachers at Four Levels of Teaching.

p* = 5	Effect		
	Sex	Level	Interaction
$n_h^\#$	1	3	3
$n_e^\dagger$	170	170	170
F	6.686	6.718	1.130
df	5, 166	15, 459	15, 459
prob.	p < .0001	p < .0001	p < .3266

Discriminant functions

$$V_{\text{sex}} = -0.704_S - 0.649_C + 0.397_I - 0.855_E + 0.416_H$$

$$V_{t1_1} = -1.081_S - 0.227_C + 0.310_I - 0.765_E + 0.300_H$$

$$V_{t1_2} = 0.414_S + 0.061_C + 0.036_I - 0.945_E + 0.058_H$$

*p = the number of dependent variables: Supportive (S), Conventional (C), Independent (I), Enriched (E), and Hostile (H).

$\#n_h$ is the degrees of freedom associated with M_h , the matrix of mean products for a classification variable or an interaction.

$\dagger n_e$ is the degrees of freedom associated with M_e , the $p \times p$ matrix of error mean products.



Results of the hypothesis testing showed support for one hypothesis.

Hypothesis Four: There is no difference in learning environments among classes in teaching levels K-2, 3-5, 6-8, and Special Education. Reject
($p < .01$)

Hypothesis Five: There is no difference in learning environments between classes taught by male and female elementary intern teachers at teaching levels K-2, 3-5, 6-8, and Special Education. Fail to reject.

Since the interaction of sex and teaching level failed to reach significance and the sex main effect has been previously analyzed and discussed, teaching level differences will be examined in detail.

Subclass means for the sex by teaching level design (Table 5.9) were used to construct the graph for mean scores of each teaching level on each dependent variable (Figure 5.2). Notable differences were found in the Supportive and Enriched dimensions of classroom behaviors. Supportive learning environments were observed more often

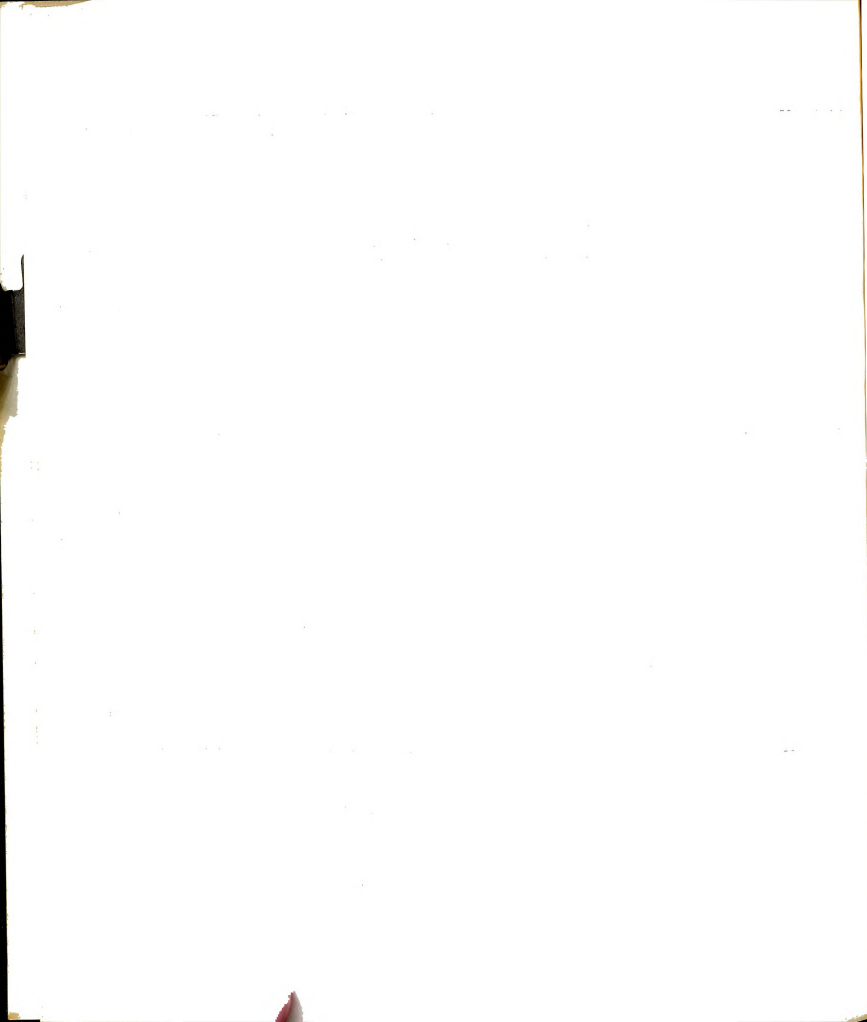
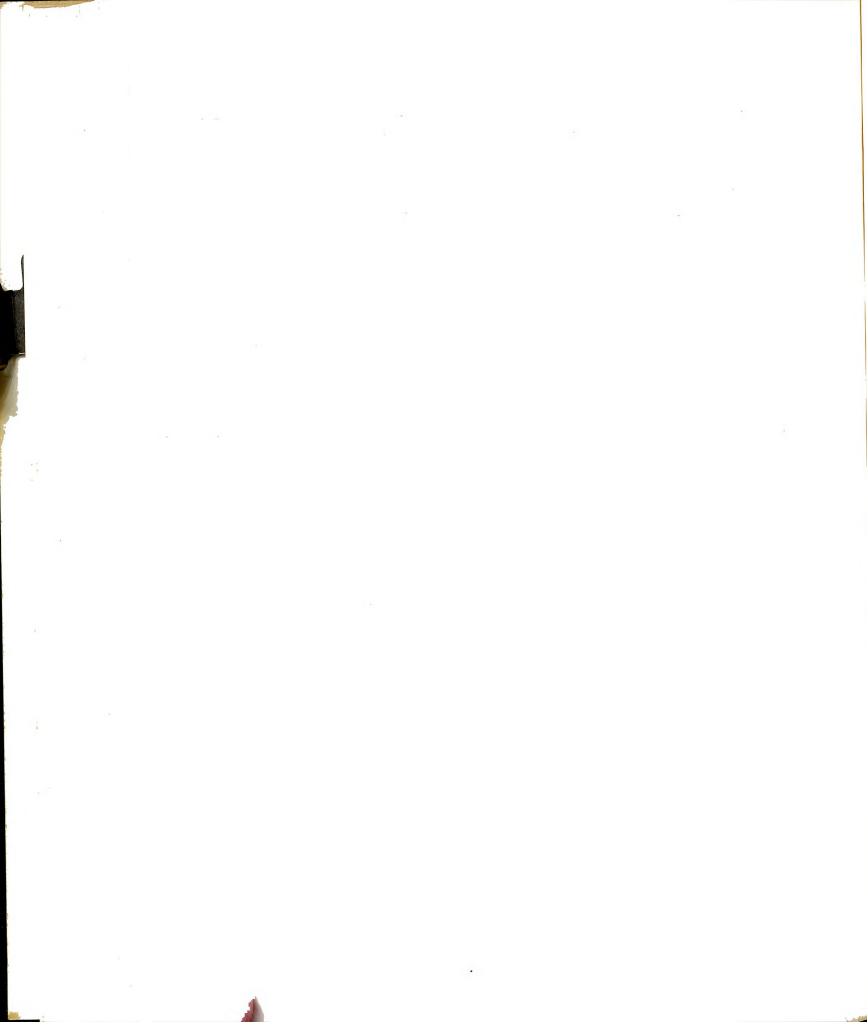


Table 5.9.--Subclass Means of Male and Female Elementary Intern Teachers at Four Teaching Levels.

Level	Learning Environment	Male	Female	Means
K-2	Supportive	-1.122	-0.232	-0.244
	Conventional	-0.091	-0.091	-0.091
	Independent	1.400	0.104	0.122
	Enriched	-0.480	-0.434	-0.435
	Hostile	0.778	0.068	0.078
3-5	Supportive	0.192	0.275	0.259
	Conventional	0.492	-0.178	-0.052
	Independent	0.143	-0.142	-0.088
	Enriched	0.184	-0.019	0.019
	Hostile	-0.400	-0.008	-0.082
6-8	Supportive	0.773	0.453	0.619
	Conventional	0.432	0.038	0.242
	Independent	-0.528	0.222	-0.167
	Enriched	0.601	0.562	0.582
	Hostile	-0.388	-0.258	-0.325
Sp. Ed.	Supportive	-1.650	-1.457	-1.515
	Conventional	0.446	0.336	0.369
	Independent	-0.279	0.416	0.208
	Enriched	0.851	1.261	1.138
	Hostile	1.236	0.476	0.704
Means	Supportive	0.234	-0.037	0.011
	Conventional	0.442	-0.092	0.001
	Independent	-0.160	0.036	0.002
	Enriched	0.416	-0.107	0.037
	Hostile	-0.198	0.030	0.011



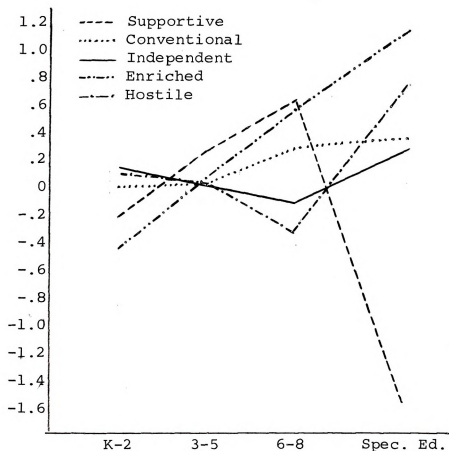
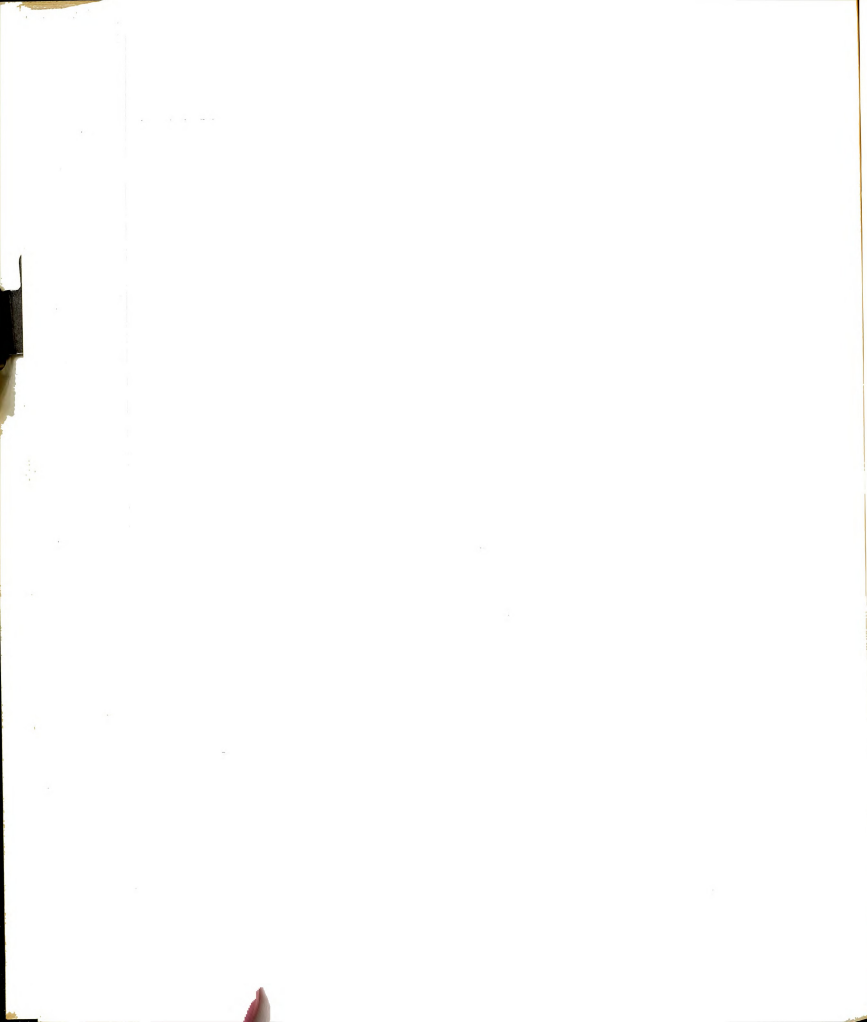


Figure 5.2.--Comparison of Overall Means for Teaching Levels of Elementary Intern Teachers on Each of the Dependent Variables.

as grade level increased in regular K-8 schools. Special Education classes had low scores on the Supportive behaviors dimension. Probably the dependence of Special Education children on their intern teacher explains some of this low score. Mutual support between teacher and pupils or among pupils themselves may be related to the age and



maturity of the individuals involved. On the other hand, Enriched learning environments were observed most frequently in Special Education classes and declined in frequency from grades 6-8 down through K-2 teaching levels. Extensive use of multi-media in Special Education is no surprise, but the fact that primary teachers were less often observed in Enriched environment is notable. Perhaps many observations were made during reading classes in the primary levels, a fact which could account for the differences.

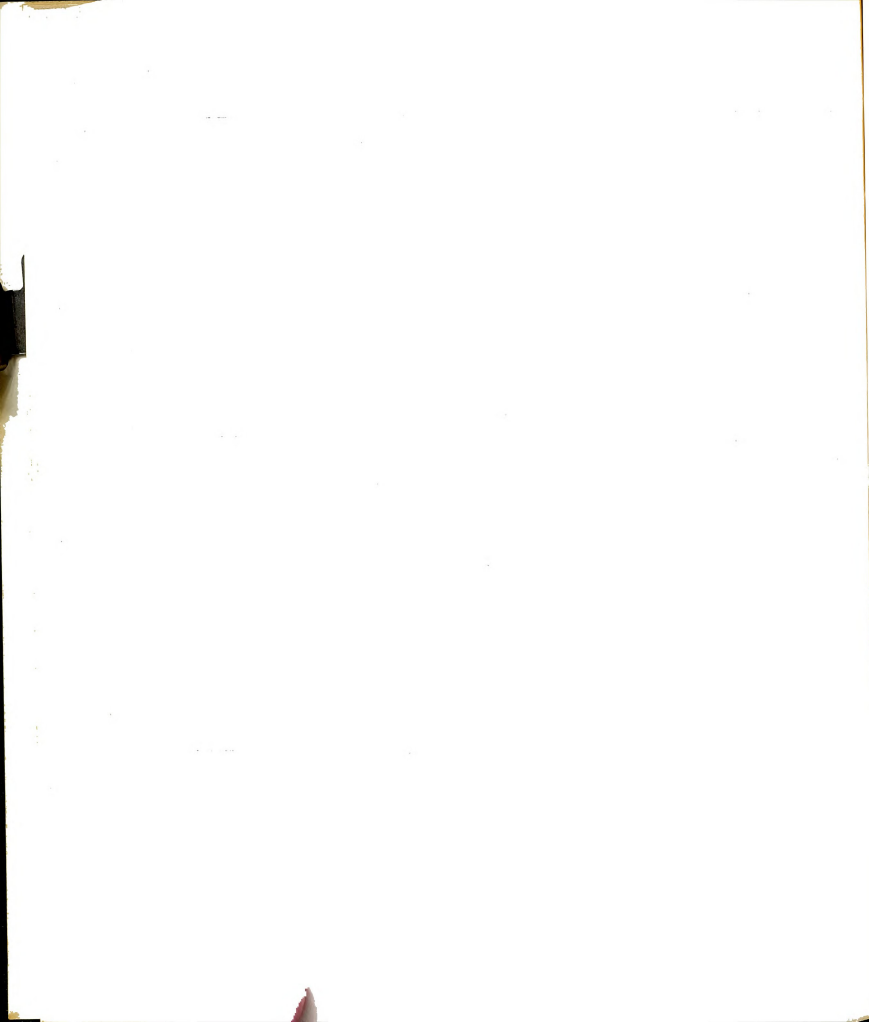
Each significant discriminant function for teaching levels was used to calculate discriminant scores for all subjects. Two separate sets of scores were obtained, the first set from the first function, the second set from

V_{t1_2} .

$$V_{t1_1} = -1.081_S - 0.227_C + 0.310_I - 0.765_E + 0.300_H$$

$$V_{t1_2} = 0.414_S + 0.061_C + 0.036_I - 0.945_E + 0.058_H$$

According to the first function, Supportive and Enriched versus Independent and Hostile learning environments accounted for most of the difference in behaviors across



teaching levels (see Table 5.11, step-down test of teaching level effect). On the second function, Enriched environments carried the most weight (negative) while all other weights were positive. Mean discrimination scores (Table 5.10) for each teaching level indicate the distinct differences between these functions.

Table 5.10.--Mean Discriminant Scores for Four Teaching Levels.

Discriminant Score	Teaching Levels			
	K-2	3-5	6-8	Spec. Ed.
First	0.678	-0.335	-1.319	0.959
Second	0.313	0.078	-0.304	-1.631

The first discriminant score for teaching levels contrasted primary and special education classes with later elementary grades (3-8). Special education and upper elementary grades were contrasted with primary and middle elementary classes in the second set of discriminant scores.

Twelve post hoc comparisons between mean discriminant scores for selected teaching levels were made on

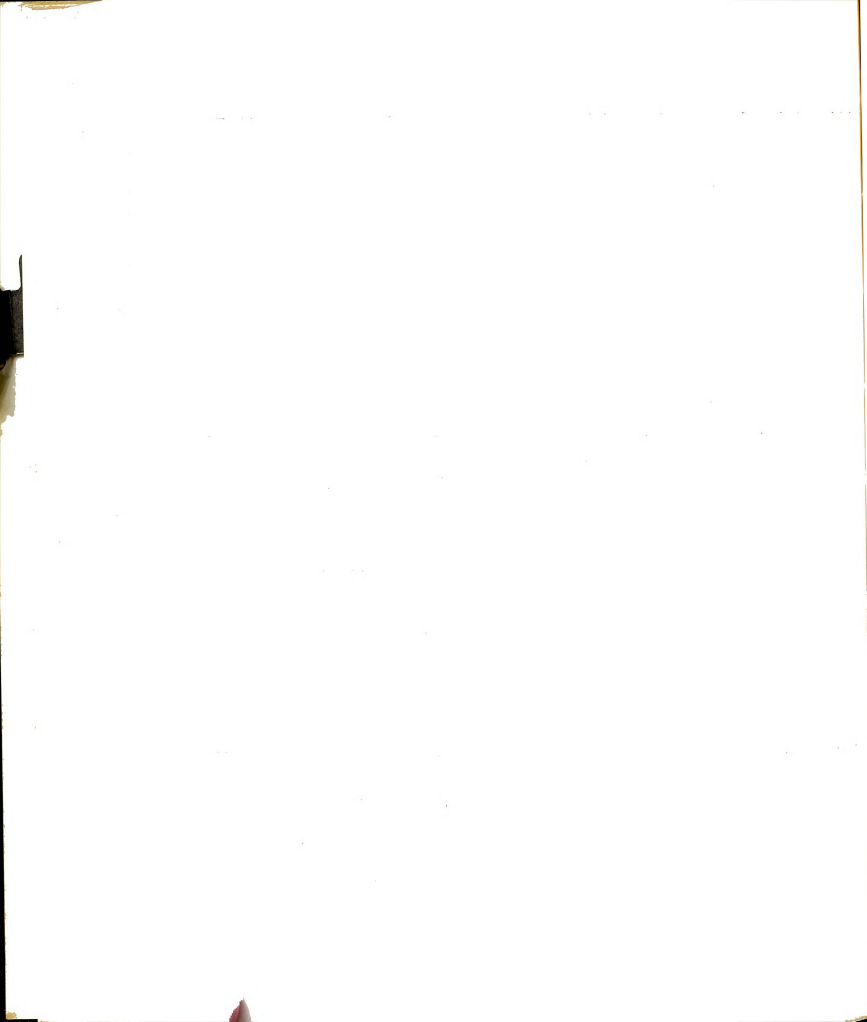
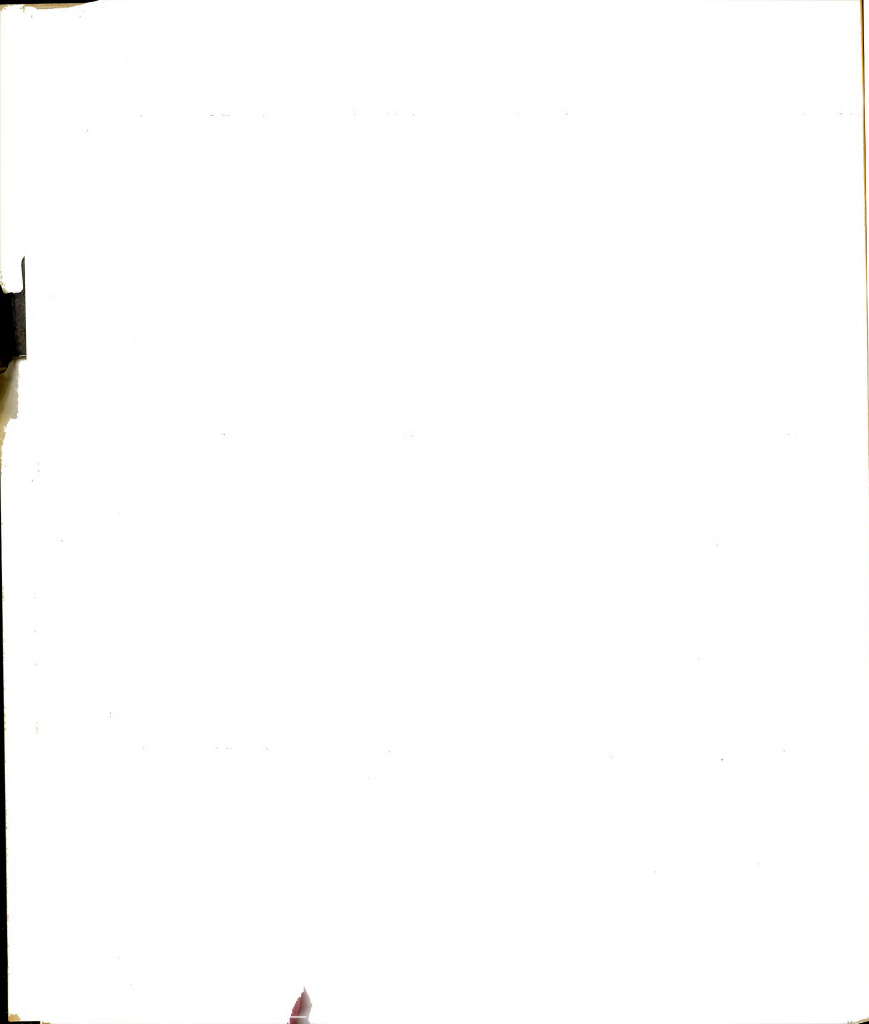


Table 5.11.--Step-down Test of Teaching Level Effect.

Learning Environments	Univariate F	Degrees of freedom	Step-down F	Degrees of freedom	α
Supportive	17.21	3/170	17.21	3/170	.01*
Conventional	0.43	3/170	0.71	3/169	.01
Independent	0.69	3/170	1.10	3/168	.01
Enriched	11.73	3/170	14.09	3/167	.01*
Hostile	2.64	3/170	1.42	3/166	.01

*Significant beyond .01 level.



each set. A fiducial level of .001 was chosen for significance.¹ The critical value was determined according to the formula:²

$$F' = (k - 1) F_{\alpha; v_1, v_2}$$

where:

F = the tabled value for $\alpha = .001$

k = 4 treatment levels

$$v_1 = k - 1 = 3$$

$$v_2 = N - k = 178 - 4 = 174. \quad 120 \text{ degrees of freedom were used.}$$

Thus:

$$F' = 3 (11.38) = \underline{34.14}$$

Tables 5.12 and 5.13 summarize the results of twelve post hoc comparisons of teaching levels on the first and second discriminant scores respectively.

¹Roger E. Kirk, Experimental Design: Procedures for the Behavioral Sciences (Belmont, California: Brooks/Cole Publishing Company, 1968), 79-81. According to the Bonferroni inequality, the overall level of α , say α_{ALL} , is equal to $k\alpha$ when k tests have been done at the α level. In this case, $k = 12$ and $\alpha_{ALL} = .012$.

²Ibid., 90-91.

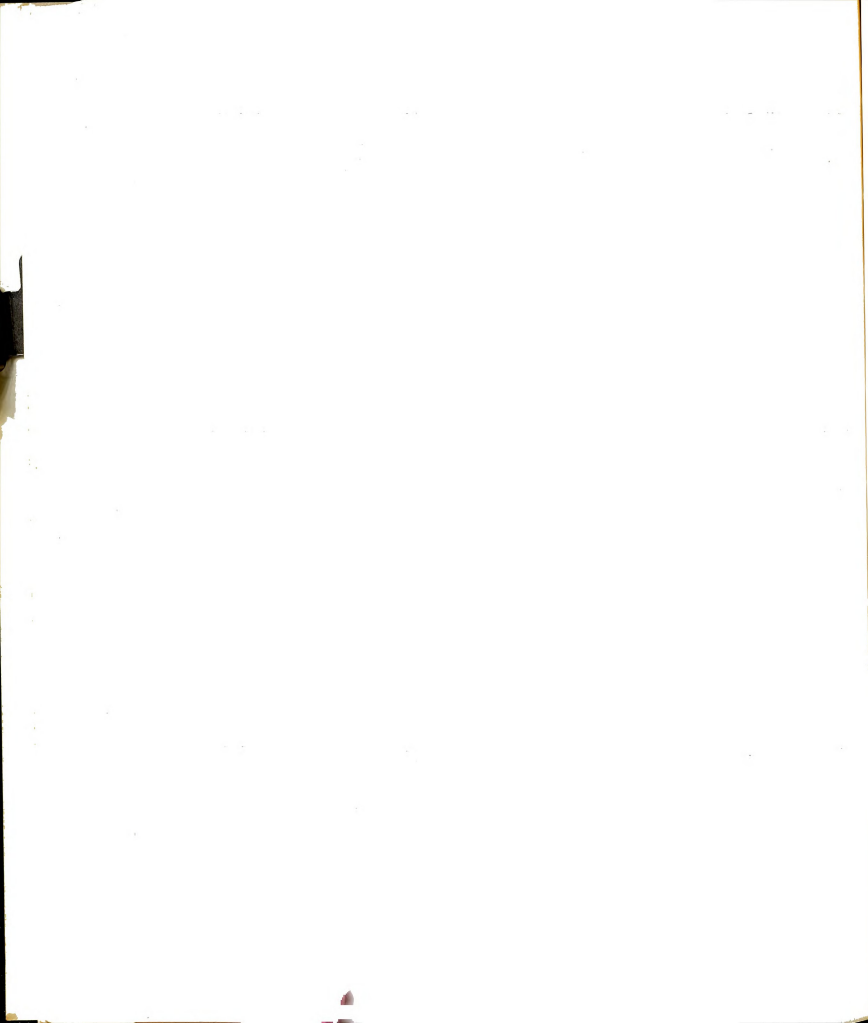


Table 5.12.--Post Hoc Comparisons of Means for Teaching Levels Using the First Discriminant Score.

Source of Variance	df	Between Mean Square	F-ratio
Grades K-8 : Special Education	1	9.77	9.59
Grades K-2 : Grades 3-8	1	51.04	50.07*
Grades K-2 : Grades 3-5	1	36.21	35.51*
Grades K-2 : Grades 6-8	1	77.57	76.09*
Grades 3-5 : Grades 6-8	1	18.76	18.40
Grades K-2 : Special Education	1	.69	.68
Grades 3-5 : Special Education	1	22.98	22.54
Grades 6-8 : Special Education	1	8.58	8.41
Grades K-2 Spec. Ed. : Grades 3-8	1	65.47	64.22*
Grades K-5 : Grades 6-8	1	25.65	25.16
Grades K-2 Spec. Ed. : Grades 6-8	1	40.38	39.61*
Grades K-2 Spec. Ed. : Grades 3-5	1	30.99	30.99

*Significant beyond the .001 level.

Contrasts between primary and middle-upper elementary levels, between primary-special education classes and middle-upper elementary groups were significant beyond the .001 level. None of the comparisons on the second set of discriminant scores was significant (Table 5.13).

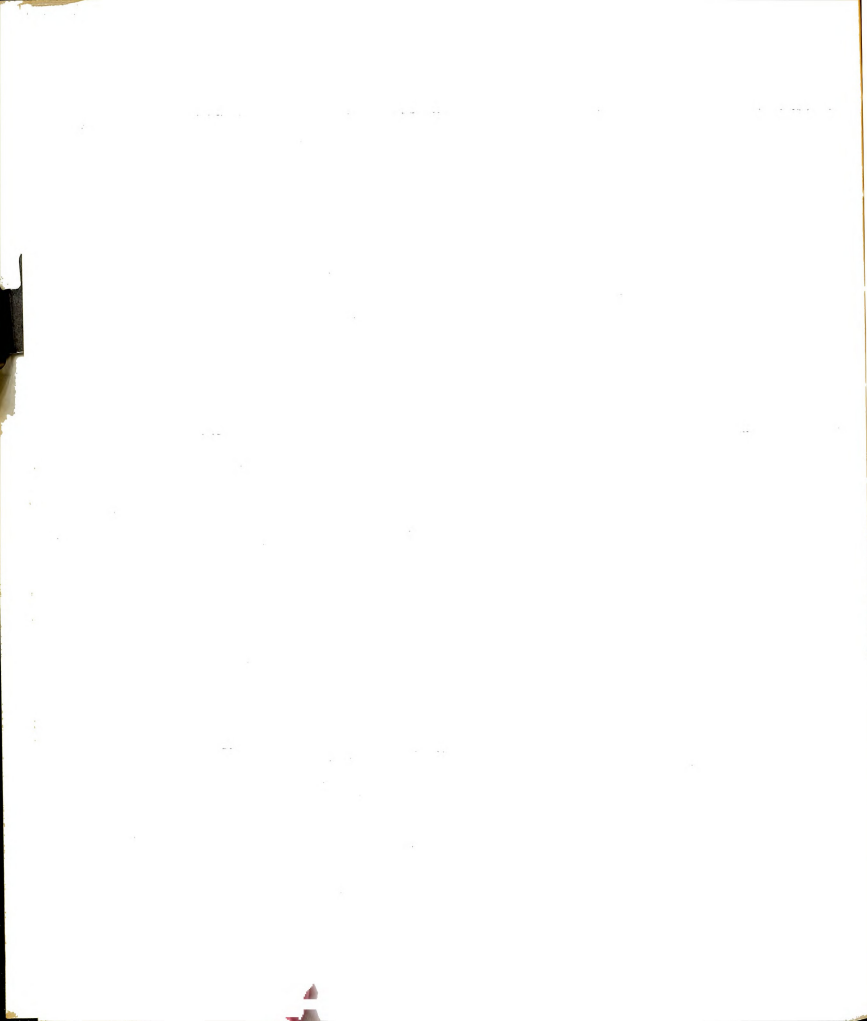


Table 5.13.--Post Hoc Comparisons of Means for Teaching Levels Using the Second Discriminant Score.

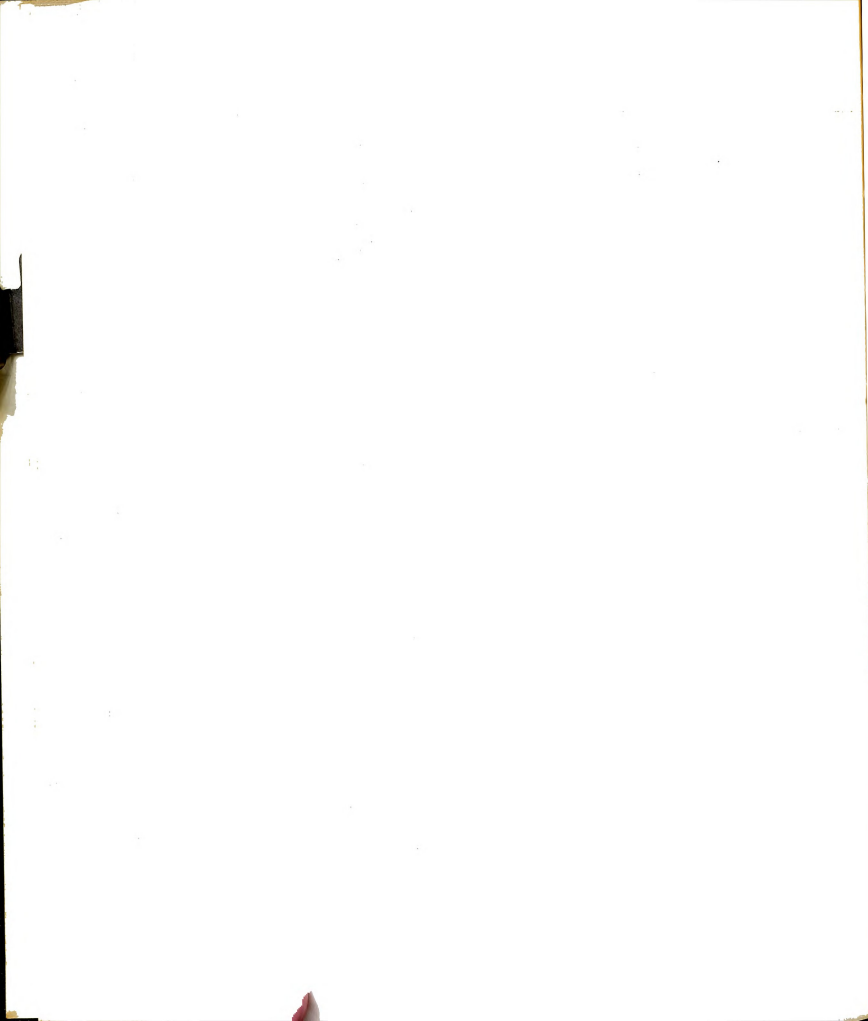
Source of Variance	df	Between Mean Square	F-ratio
Grades K-8 : Special Education	1	28.85	29.40
Grades K-2 : Grades 3-8	1	5.69	5.80
Grades K-2 : Grades 3-5	1	1.95	1.98
Grades K-2 : Grades 6-8	1	.49	.50
Grades 3-5 : Grades 6-8	1	2.82	2.87
Grades K-2 : Special Education	1	33.18	33.81
Grades 3-5 : Special Education	1	21.68	22.09
Grades 6-8 : Special Education	1	7.59	7.74
Grades 3-8 : Grades K-2, Special Education	1	7.22	7.35
Grades K-5 : Grades 6-8	1	23.47	23.92
Grades 6-8 : Grades K-2, Special Education	1	.38	.38
Grades 3-5 : Grades K-2, Special Education	1	12.64	12.88

Summary

Multivariate analysis of variance was employed to test the significance of differences in learning environments for personality types, sex, and teaching levels. Sex and teaching levels were both significant at greater than the .01 level of confidence. Male teachers were observed in relatively more Conventional, Enriched, and Supportive learning environments. Female intern teachers



had negative overall mean scores on these dimensions and slightly positive overall means for Independent and Hostile learning environments. Special education classes were obviously different from classes in the K-8 organizational system. Learning environments for special education interns were more Enriched and less Supportive than at any other level. Grades 6-8 portrayed the most Supportive learning environments and primary classes the least Enriched.



CHAPTER VI

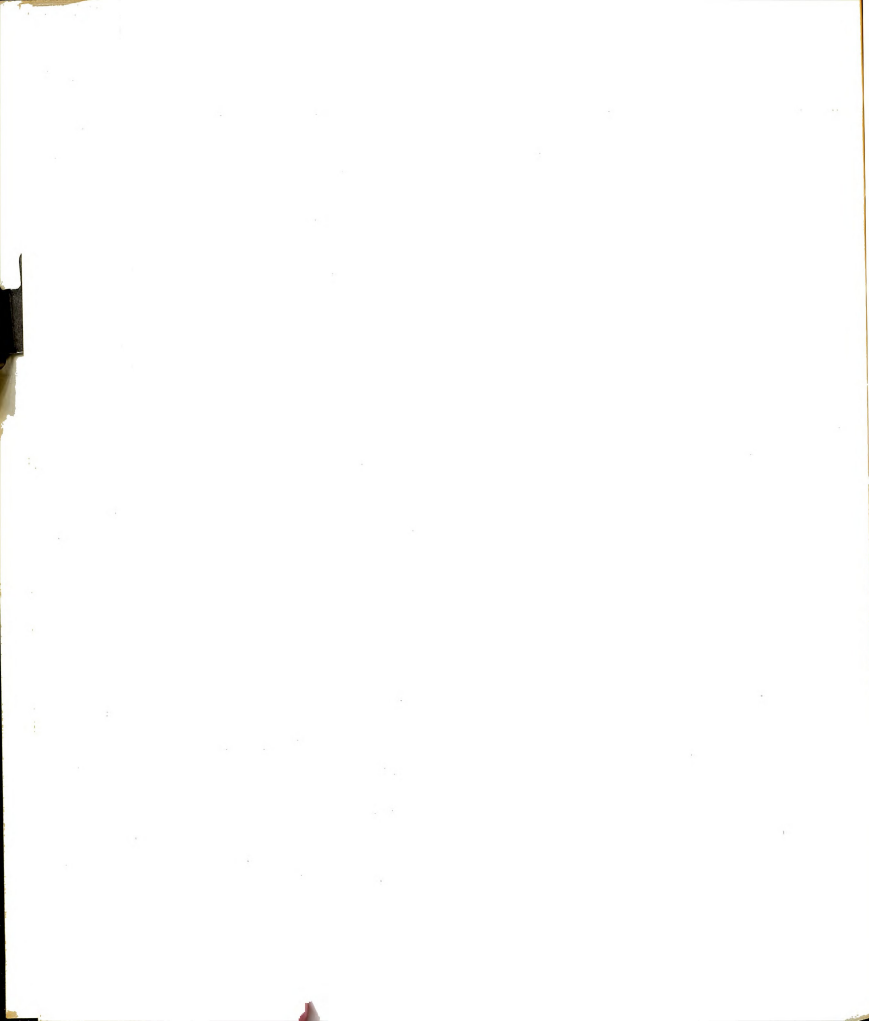
CONCLUSION OF THE INVESTIGATION

Introduction

Four major topics are discussed in this final chapter. After summarizing the investigation, limiting factors are presented. With these limitations in view, conclusions are derived from the study. Implications of the investigation are considered in the concluding section of the chapter.

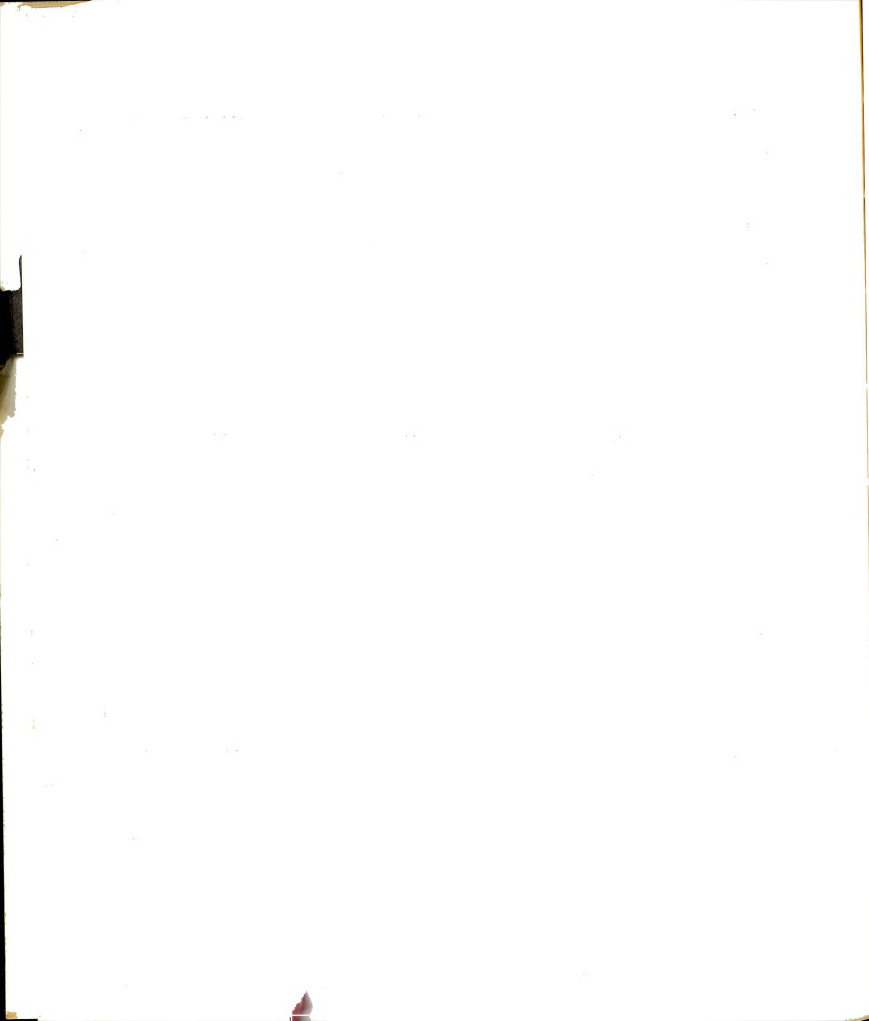
Summary of the Investigation

The researcher investigated the relationship between two forms of observation of teacher behavior: (1) the teacher's perceptions of his own attitudes, needs, and manner of believing, and (2) an external source's perceptions of overt behaviors in the teacher's elementary school classroom. It was conjectured that accurate reports of self-perceptions (indirect observations) and

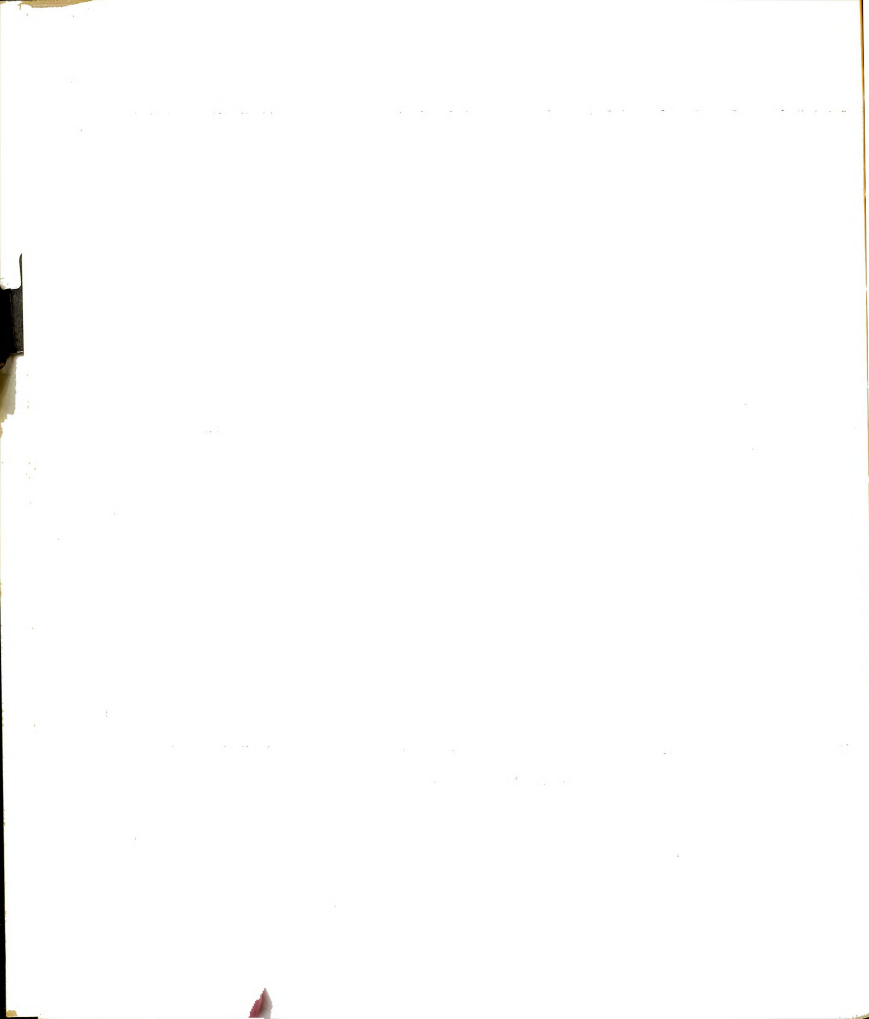


unbiased records of overt classroom behaviors (direct observations) would be congruent. That is, personalities of teachers would be consistent with the learning environments observed in their elementary school classrooms. Teachers expressing positive attitudes toward children, open belief systems, less need for order, less dominance or aggression were expected to be more flexible and supportive in their classrooms than teachers having opposite or near opposite characteristics.

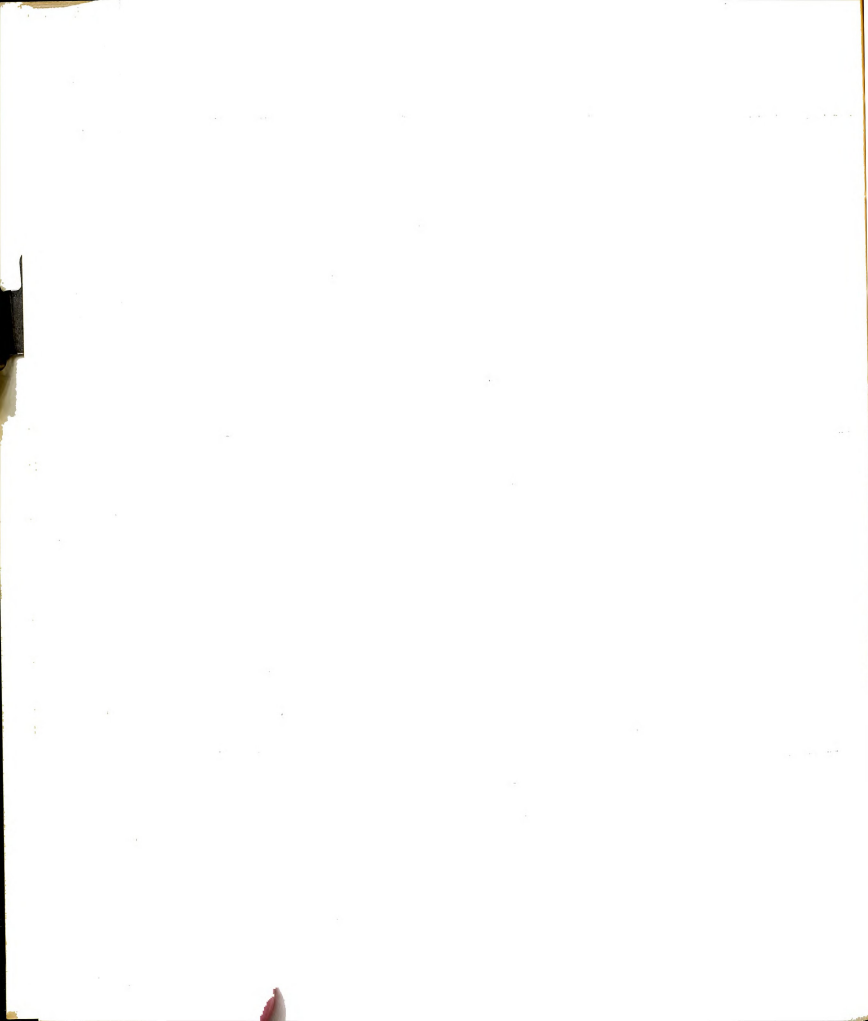
Data were gathered in two phases from 178 participants in the Elementary Intern Program of Michigan State University. Subjects entering EIP in Fall, 1967 and Winter, 1968, responded to three personality inventories: the Minnesota Teacher Attitude Inventory, the Edwards Personal Preference Schedule, and the twenty-item Rokeach Dogmatism Scale. Thirty-seven trained observers recorded overt classroom behaviors of these individuals during the final six weeks (May-June, 1969) of their teaching internship in public elementary schools of southern Michigan. The Observation Schedule and Record (OSCAR III) was employed as a standardized recording form for each of the six observations per intern teacher.



Factor analytic techniques were applied to parsimoniously describe the sixteen personality scores (Q-type analysis) and one hundred categories of OScaR III (R-type analysis). Two personality types were identified by analyzing the factor loadings of individuals on the first rotated solution which accounted for ninety-two percent of the total variance. The personality types were denoted Self-Centered (132 interns) and Well-Integrated (46 subjects). The total scores on overt classroom behaviors for the 178 intern teachers were intercorrelated, a factor matrix formed, and the principal axis solution rotated orthogonally. By analyzing the factor loadings of each factor in the fourth rotated solution (selected as more parsimonious yet accounting for at least one-fourth of the total variance) five learning environments were described: Supportive, Conventional, Independent, Enriched, and Hostile. Factor scores were computed for each subject on each of the five factors. A five-variate (one for each learning environment) multivariate analysis of variance was employed to test the significance of differences in mean vectors for each of the following hypotheses:

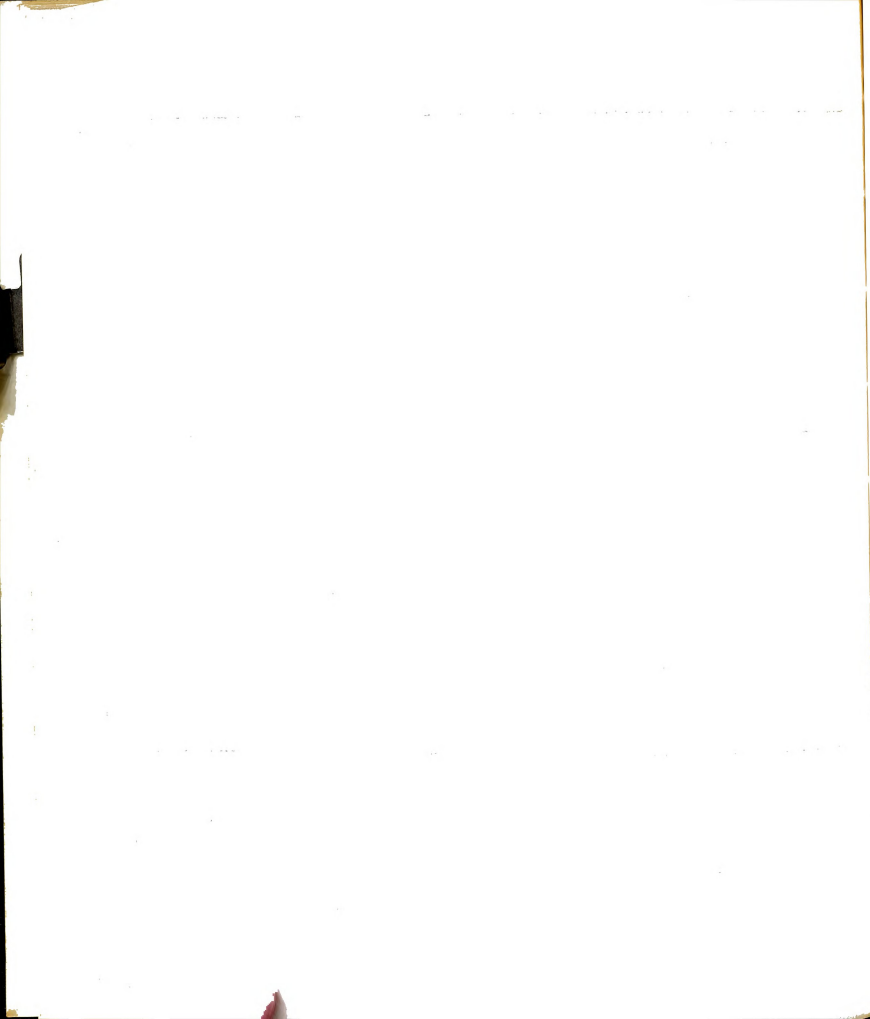


- Hypothesis One: There is no difference in learning environments between teachers identified as having Self-Centered or Well-Integrated personalities. Fail to reject.
- Hypothesis Two: There is no difference in learning environments between classes taught by male or female elementary intern teachers. Reject ($p < .01$)
- Hypothesis Three: There is no difference in learning environments between classes taught by male or female elementary intern teachers identified as having Self-Centered or Well-Integrated personalities. Fail to reject.
- Hypothesis Four: There is no difference in learning environments among classes in teaching levels K-2, 3-5, 6-8, and Special Education. Reject ($p < .01$)
- Hypothesis Five: There is no difference in learning environments between classes taught by male and female elementary intern teachers at teaching levels K-2, 3-5, 6-8, and Special Education. Fail to reject.



Discriminant score analysis indicated that male intern teachers were observed more often in Conventional, Supportive, and Enriched and less frequently in Independent and Hostile learning environments than were female intern teachers. Scheffe' post hoc comparisons of mean discriminant scores resulted in significant differences ($p < .001$) between the following teaching levels:

1. Grades K-2 portrayed more Independent and Hostile, less Enriched, Supportive, and Conventional learning environments than Grades 3-5, Grades 6-8, and combined intermediate and upper elementary teaching levels.
2. Early elementary and Special Education classes were observed with much less Supportive, more Enriched, Hostile, and Independent learning environments than intermediate and upper elementary classes combined or upper elementary grades alone.

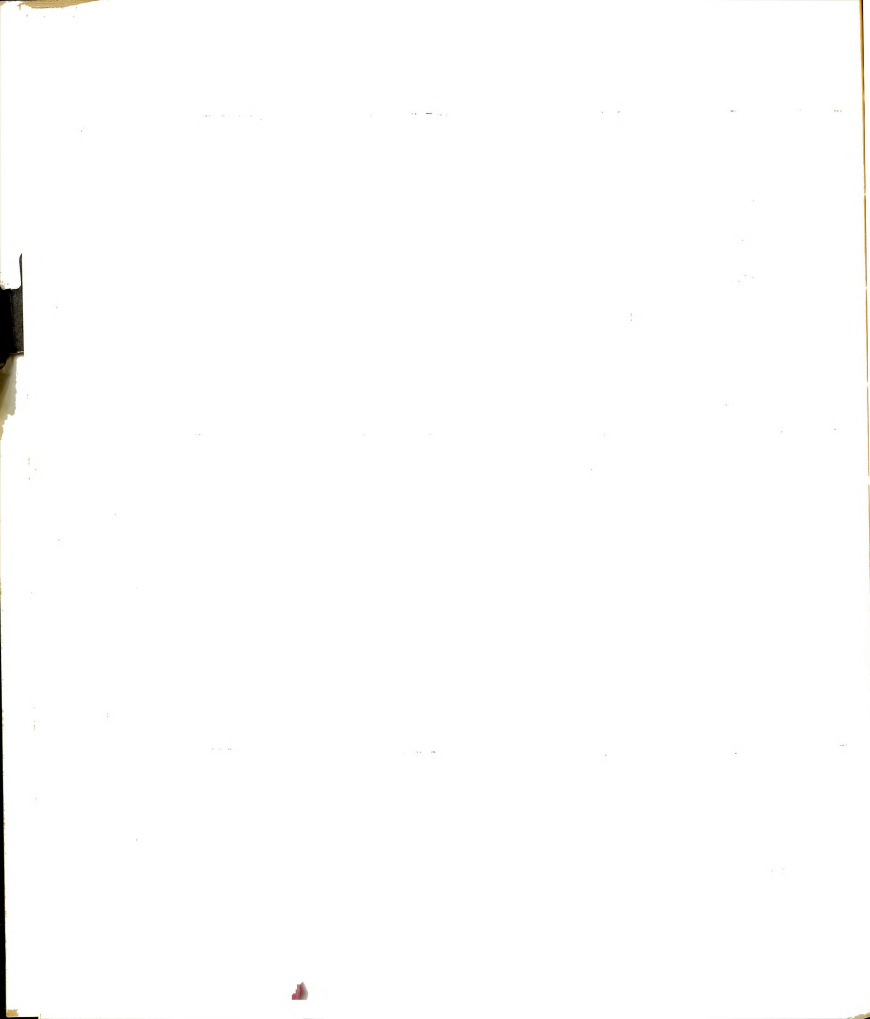


Limitations of the Investigation

This research was conducted in a field setting rather than the scientific educational laboratory. Therefore many limiting factors must be enumerated before conclusions derived from the study can be stated, or generalizations drawn from them.

Data Collection

A major problem in this study was the time span over which data were collected. Two distinct time periods were involved. During Fall Term, 1967 and Winter Term, 1968, subjects responded to items on the three personality inventories. What has been termed indirect observations, that is, self-perceptions of the pre-intern regarding his attitudes toward children and teaching, his manifest needs and beliefs were assessed. Direct observations (perceptions by an outside source) were recorded during a six-week period from May-June, 1969. T_1 = time of indirect observations = Fall, 1967 to Winter, 1968; T_2 = time of direct observations = May-June, 1969. The time span covered eighteen months for subjects entering EIP in Fall,

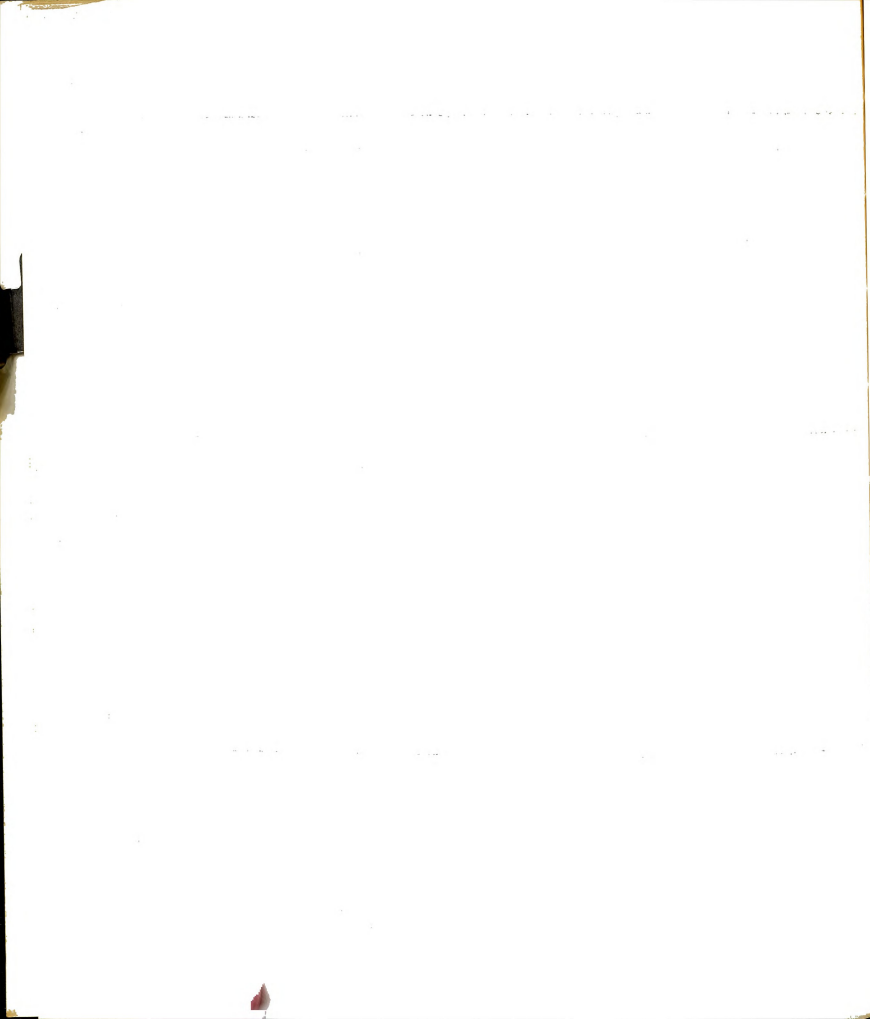


1967 and fifteen months for students taking their methods courses in Winter, 1968.

Direct Observation of Overt
Classroom Behaviors

Probably no classroom observation study follows all the guidelines established for such research. Attempts must be made to approach the ideal, however, and failure to do so must be reported.

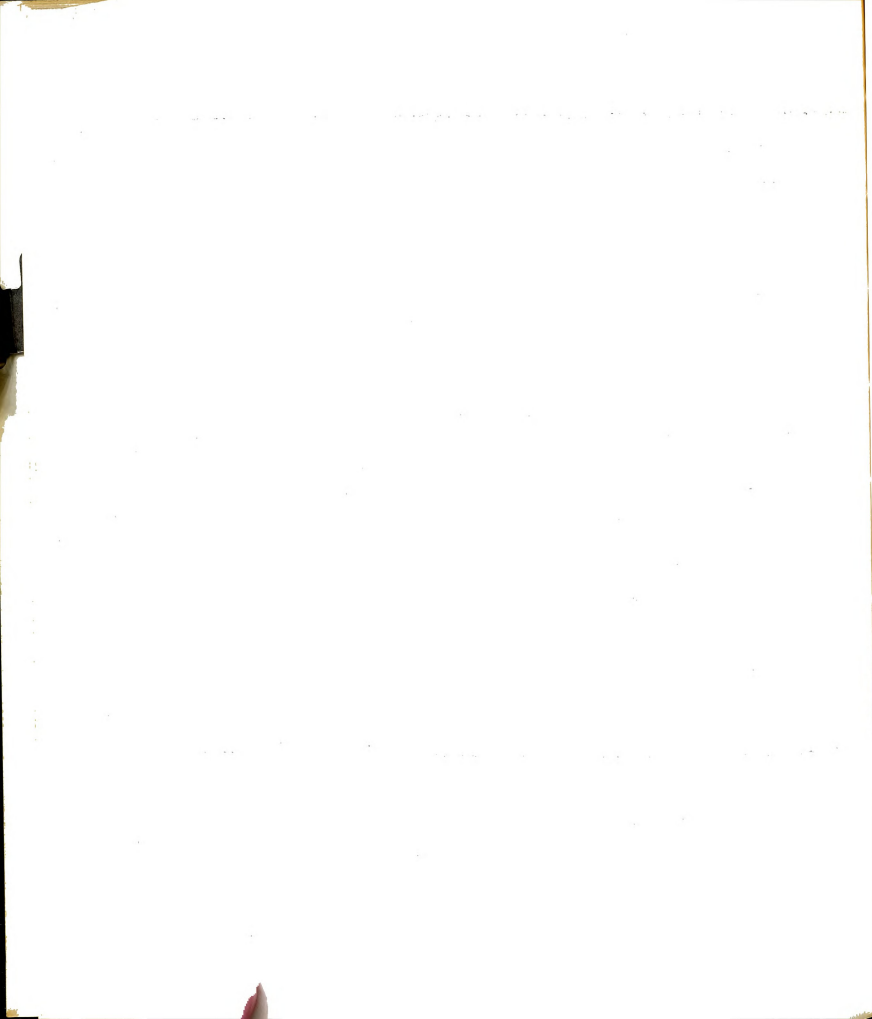
Selection of an observation form appropriate to the nature of the problem is a critical step in a classroom observation project. Several advantages weighed heavily in choosing the Observation Schedule and Record (OSCAR III and 5V). First, the instrument was originally designed to gather data on the classroom behaviors of beginning elementary school teachers. The subjects of this investigation were teaching full time as beginning teachers with supervision, and thus appeared to be comparable. Second, categories were of such a nature as to be evidently present or not, thus observer training was facilitated. Third, the process of observing was separated from the process of scoring. No judgment of



appropriateness of behaviors was required of the observers. They merely checked all behaviors which occurred in a five-minute interval. Verbal interaction between the teacher and pupils was not tapped by the OSCAR form employed in this study. Thus the extent to which verbal behaviors affect classroom learning climate would limit the generalizability of the results.

Another limitation regarding the classroom observations lay in the training procedures. Aside from the short period (four hours), filmed episodes rather than actual classroom settings were utilized in learning to record the overt behaviors. The number of observers being trained hindered practice in real elementary school classrooms. The films used in training the observers approximated actual classrooms since the filmed episodes were developed specifically for such work.

Methods of observing employed in this study may have introduced other biases. The number of observers ($N = 37$), the fact that each intern consultant observed the intern teachers assigned to him from the beginning of the year, and that observers were not crossed with

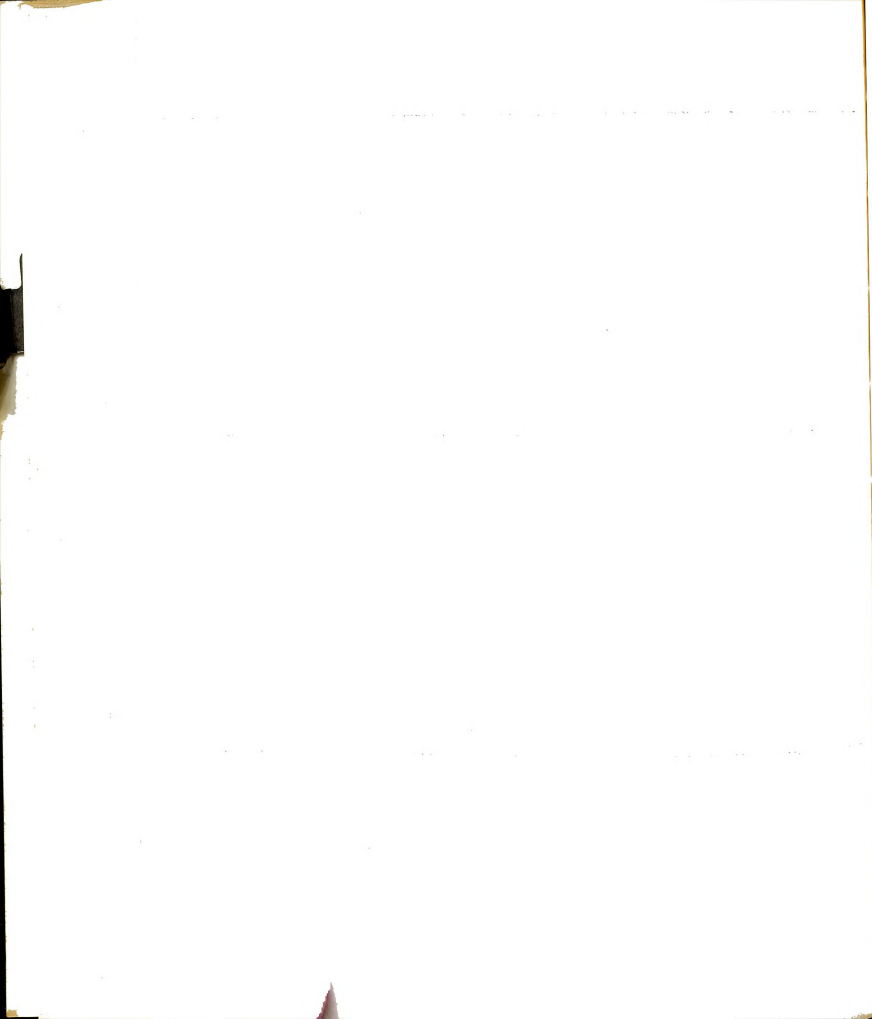


subjects or the ten centers all could have contributed unknown biases into the investigation.

Other possible intervening variables can be enumerated: location of the EIP centers, the school settings, the socio-economic status of both intern teachers and their students. These elements, when uncontrolled as in this study, may easily introduce bias into the research.

Statistical Techniques

Analysis of variance is generally considered a very strong statistic to employ when analyzing data. Findings are easily generalized because the test is robust to violations of the assumptions of normality and homoscedasticity. But multivariate analysis of variance is not robust to violations of these assumptions. Very complex tests are required to prove the assumptions true for the data being analyzed. Since these tests were not performed, results of this investigation must be generalized with care to comparable groups of subjects.

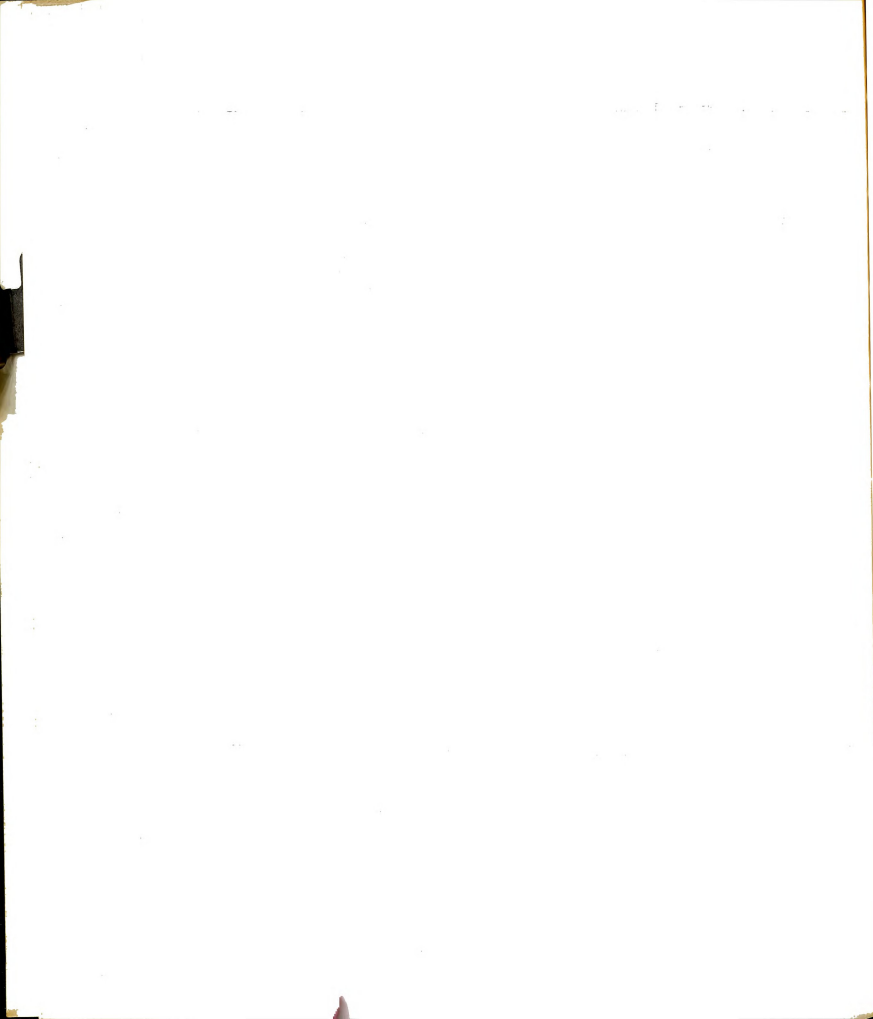


With these cautions in mind, then, the conclusions of this study will be stated. The reader should keep them in view when considering conclusions and their implications.

Conclusions

Conclusions drawn from the study are listed below.

1. Factor analytic techniques were employed to parsimoniously and meaningfully describe personality and classroom observation variables.
 - a. Individuals expressing positive attitudes toward children and teaching, open-mindedness in their belief systems, less need for aggression, dominance, exhibition, order, endurance, succorance, affiliation, autonomy, deference, nurturance, and intraception were distinguishable from teachers not having these characteristics.



- b. Distinct learning environments were identified by analyzing total scores of intern teachers on OScaR III observation records of overt behaviors in their elementary school classrooms.
2. Learning environments of Well-Integrated intern teachers did not differ significantly from learning environments of Self-Centered intern teachers identified in this study.
3. Learning environments of male intern teachers of this sample differed significantly from those of female intern teachers. Elementary school classrooms of male teachers were observed as more Supportive, Conventional, and Enriched while female intern teachers were observed in more Independent and Hostile learning environments.
4. Learning environments were significantly different in various teaching levels for this sample of intern teachers.
 - a. Grades 6-8, 3-5, and 3-8 were observed to have more Enriched, Supportive, and



Conventional learning environments than K-2 classes.

- b. Grades K-2 and Special Education classes combined were observed as more Enriched, Hostile, and Independent learning environments than grades 6-8 or grades 3-8. The latter teaching levels showed more Supportive learning environments.

Though more Independent learning environments were observed among female intern teachers and in primary (K-2) classes where the ratio of female to male teachers was 71/1; and though more Supportive learning environments were observed among male teachers and in upper elementary (6-8) classes where male teachers outnumbered female teachers, no significant interaction between sex and teaching level was obtained.

Implications of the Investigation

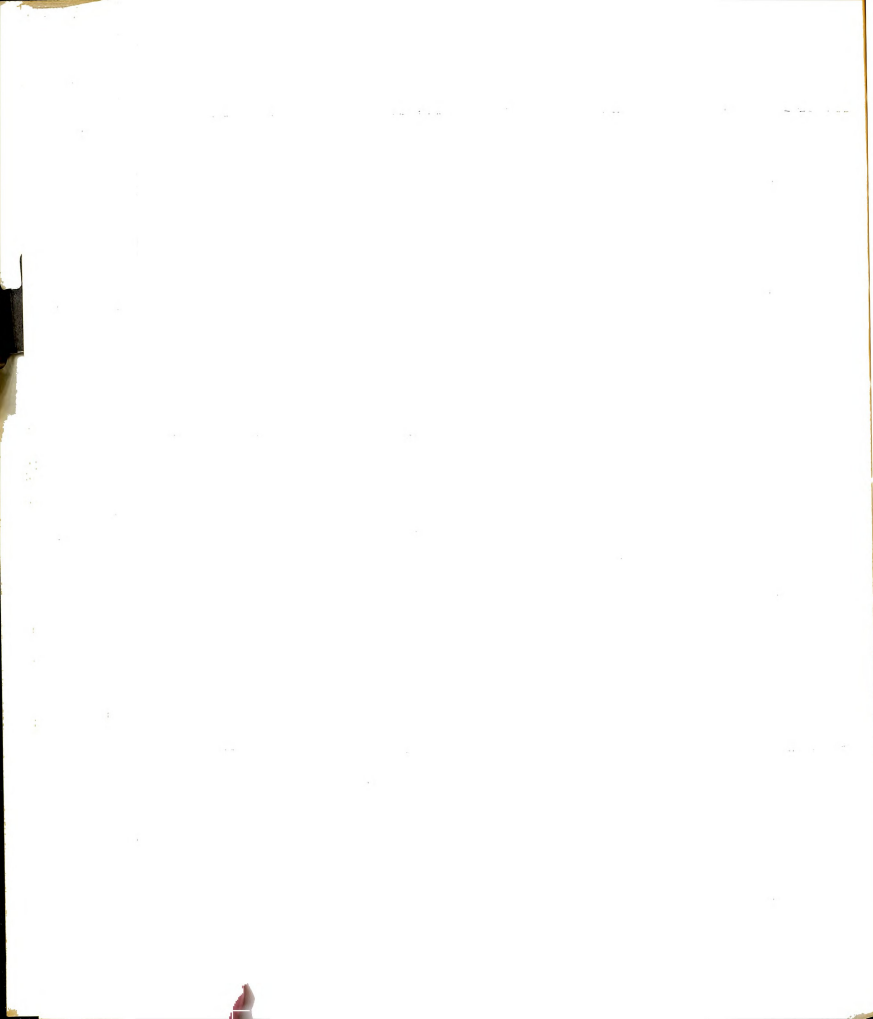
Teaching personnel problems demand as much attention today as they have in the past. Large numbers of



teachers leave the profession for various reasons. Still, little is known about the comparative effectiveness of those who remain and those who leave. The surplus of teachers on the job market allows teacher education institutions to be more selective among applicants. Yet teaching potential is difficult to determine without further knowledge of the factors which constitute successful teaching. Rising cost of living and collective bargaining by teacher organizations have brought increases in teacher salaries. Laymen demand that increased expenditures for education bring increased returns in teaching effectiveness. Salary schedules and promotions of personnel are usually based on some estimation of teaching merit. Federal monies have been expended to stimulate development of comprehensive model teacher education programs.¹ Follow-up studies of teaching effectiveness are needed to evaluate these changes in college curriculums.

Each of these factors requires assumptions about what constitutes good teaching and predictions regarding

¹Joel L. Burdin and Kaliopée Lanzillotti, A Reader's Guide to the Comprehensive Models for Preparing Elementary Teachers (Washington, D.C.: Eric Clearinghouse on Teacher Education, 1969).



alternate courses of action in achieving effective teaching. Often assumptions and predictions are not directly, much less explicitly, stated. Furthermore, their accuracy is not always checked. This investigation suggests possible alternatives for study of teacher effectiveness in teacher education, selection and placement of personnel, supervision and in-service education of teachers, and further research on teaching.

Teacher Education

Significant differences in learning environments between male and female elementary intern teachers and between various teaching levels in the elementary school suggest the need for differential preparation of teachers. Programs should be personalized to meet the needs of students according to their sex and the grade level they plan to teach. Internship in various positions on the school staff may help future teachers select jobs for which they feel most competent.

Teachers, university personnel, and members of the community should design teacher education programs



which develop competencies future teachers will need. Interns who can create and maintain supportive and enriched learning environments and promote independent learning as pupils mature will certainly meet the challenge of educating American youth.

No personality pattern has been demonstrated as essential for teaching, though we might suspect a Well-Integrated Personality to be more effective than a Self-Centered Personality. Teacher educators should create an atmosphere wherein students can assess their own personality and attitudes and find guidance in modifying components they wish to improve.

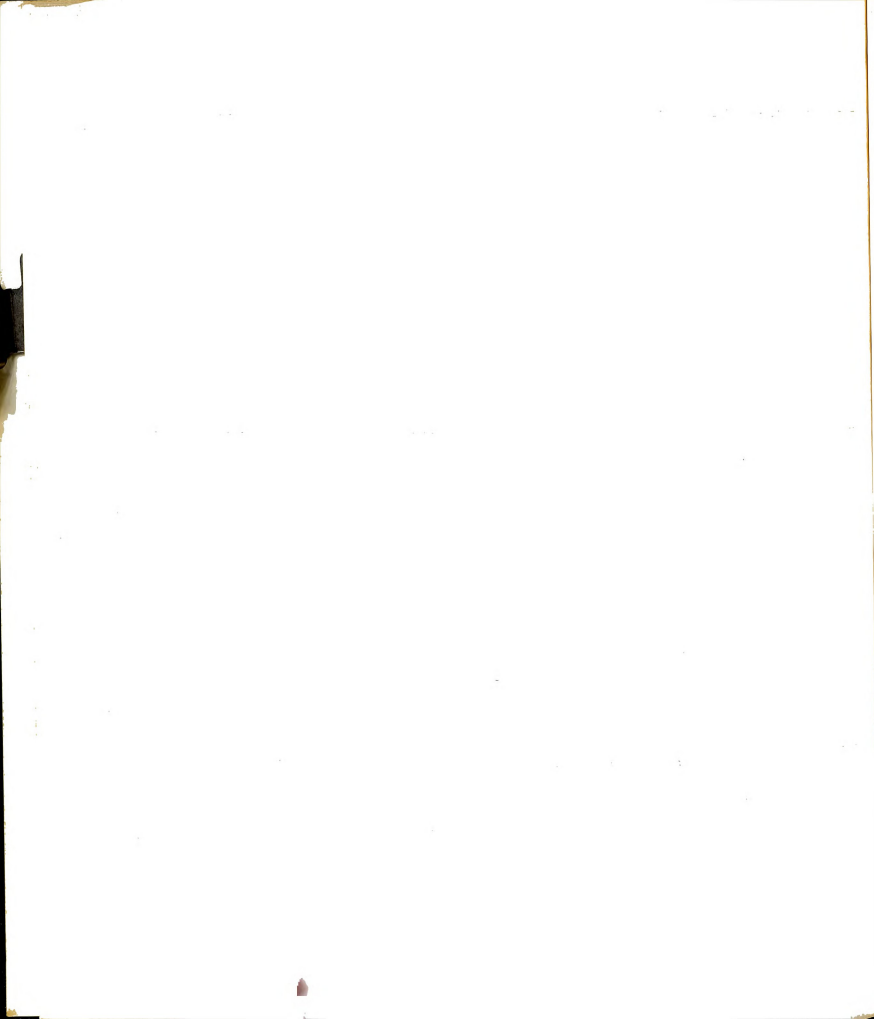
The usefulness of observing specific behavior cues as a criteria for teacher effectiveness has been demonstrated. Teacher education candidates should be exposed to many observation schedules, become efficient in the use of one or more as a means of self-appraisal, and finally design their own system consistent with their philosophy of teaching and education.



Recruitment and Placement

Male intern teachers exhibited more Supportive, Enriched, and Conventional classroom learning environments than did female elementary intern teachers. If Supportive and Enriched learning environments are desirable in elementary school classrooms, two suggestions might be made. First, more male teachers should be recruited for elementary school teaching positions. Second, elementary school female teachers should be guided in creating and maintaining Supportive and Enriched learning environments.

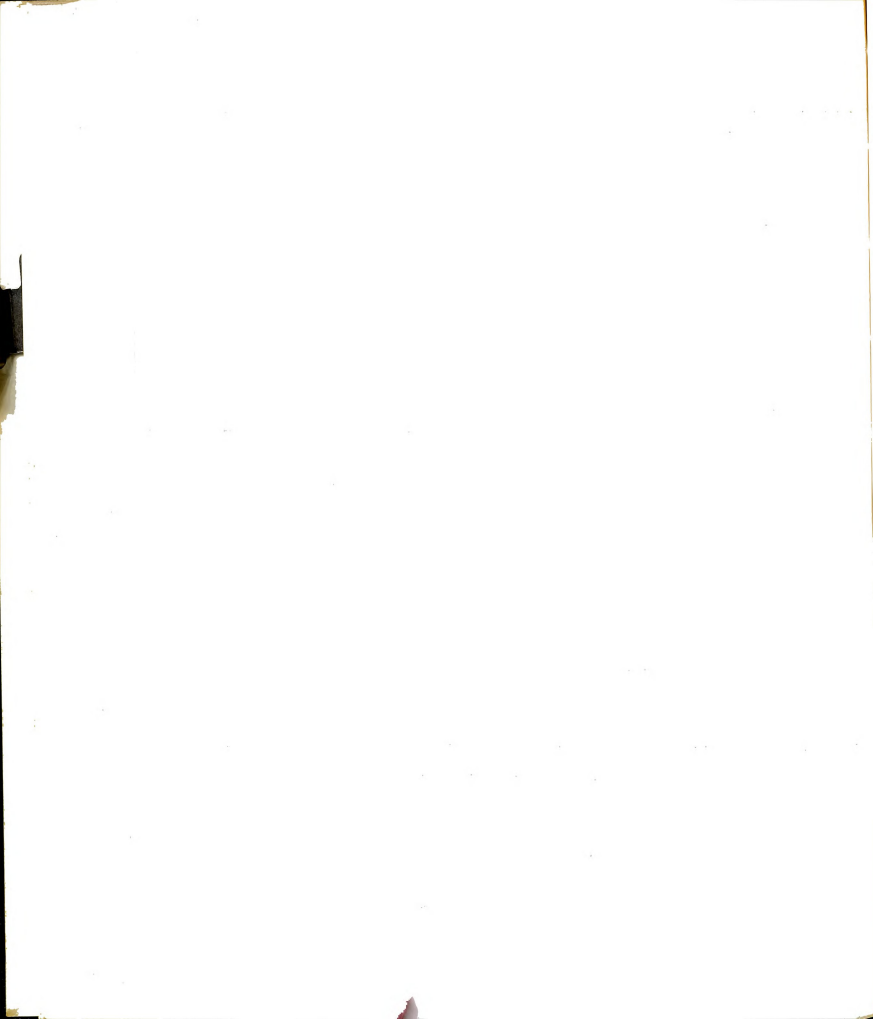
Female intern teachers were observed in more Independent and Hostile learning environments. Most female interns of this sample taught in primary and intermediate levels where the teacher is frequently engaged with smaller groups of pupils while others pursue independent activities. Are primary children able to work independently or should such activities be less frequent in early elementary grades and increase as the child progresses through school? Perhaps class size should be reduced on the primary level or several teacher aides per class should be employed to guide the independent work.



Teacher Supervision and
In-Service Education

Intern consultants assist five or six intern teachers (participants in the Elementary Intern Program) throughout their first year of teaching. If this relationship is perceived as a "helping" rather than coercive interchange, beneficial results should accrue. Consultants should be aware of the attitudes and personal needs of their interns, the assets and limits imposed by such attitudes and personal qualities. Differences in learning environments at various levels should be understood by consultants. Nor should they expect male and female interns to teach the same way. They should guide intern teachers in techniques of self-appraisal of their attitudes toward children and teaching, their needs and beliefs, and also overt teaching behaviors and their relationship to personal qualities.

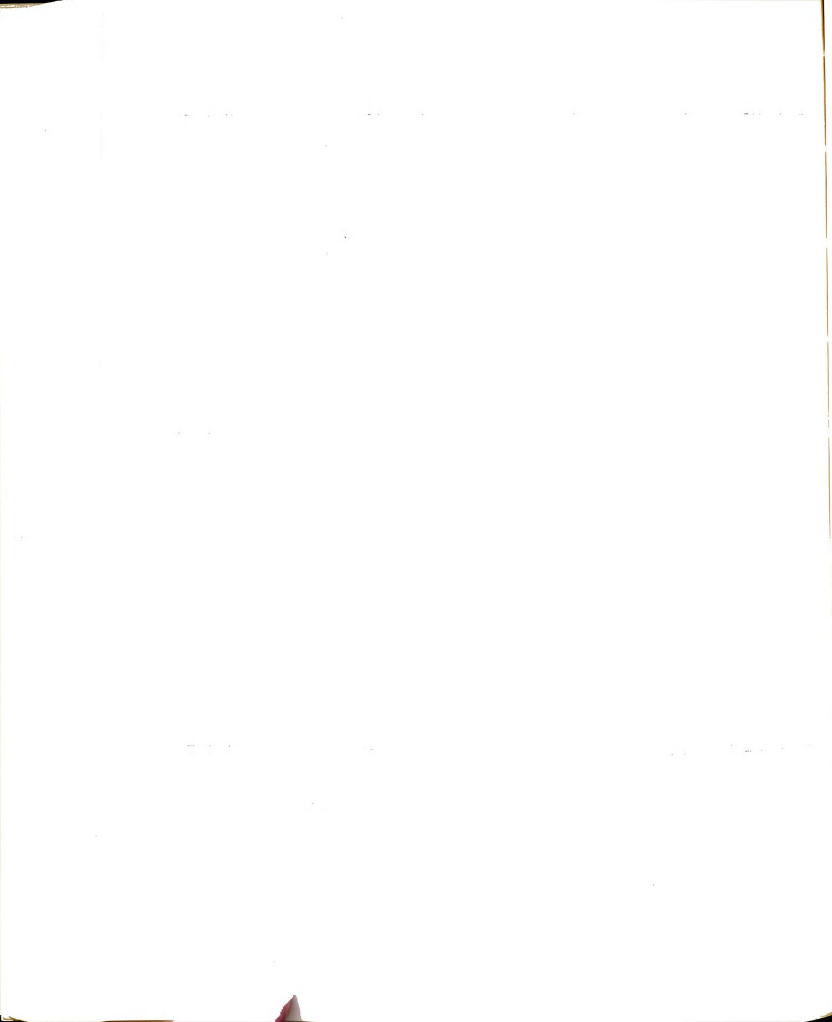
Consultants could guide female intern teachers in developing more Supportive and Enriched learning environments. Hostility would probably decrease if emphasis were placed on the positive approach.



Intern consultants would probably enhance their effectiveness if specific behaviors were observed regularly. An observation form like the OScAR could provide objectivity to their visits. During the internship year ten visits (one per month) could be devoted to use of a specific form agreeable to both intern and consultant. A follow-up conference comparing observations could be held, encouragement given, and suggestions for improvement proposed by the intern.

Suggestions for Further Research

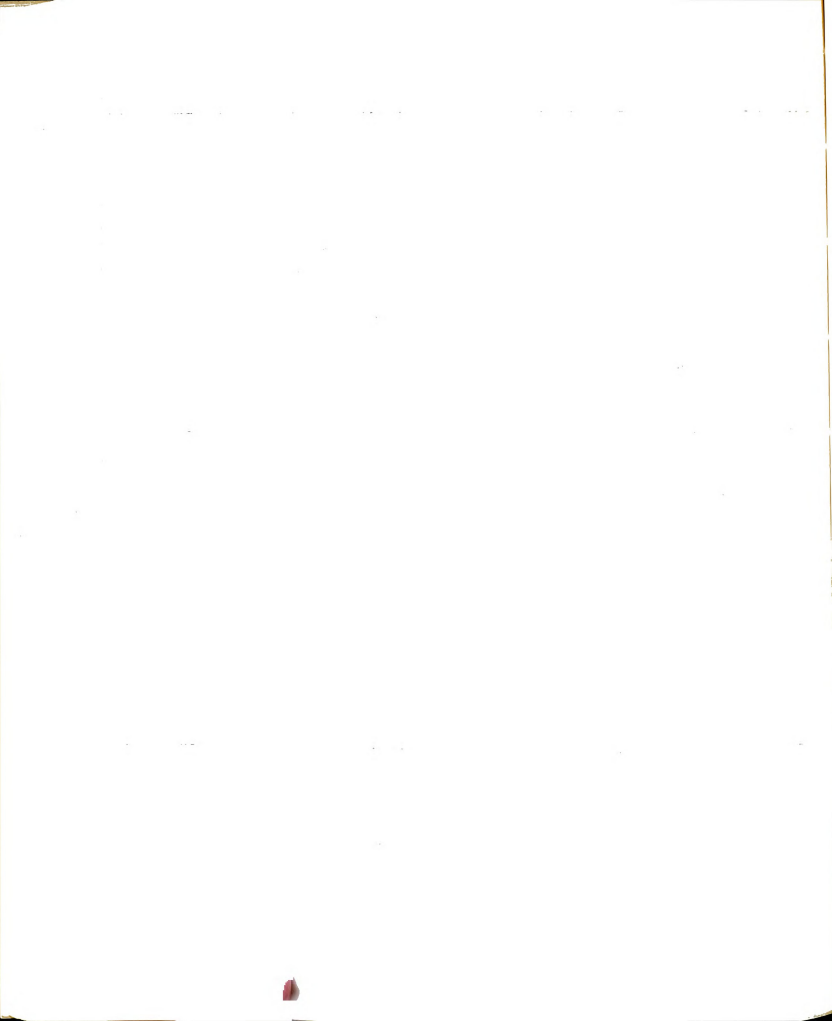
The theory upon which this research was based, that a congruent relationship exists between direct and indirect observations of teacher behavior, was not supported in this investigation. The major problem, however, may have been the data collection procedures. It is probably unreasonable to assume that an individual's self-perceptions at T_1 would be identical to his self-perceptions at T_2 (1-1/2 years later) when many experiences have intervened. Research should be undertaken to test the congruent relationship between teachers'



self-perceptions and observations of their overt teaching behaviors when assessments are made simultaneously.

Three personality types might be identified in future studies: Self-Centered, Well-Integrated, and Mixed. The criteria used in assigning persons to types could be (1) the highest factor loading exceeds .40 while the second loading is less than .40; or (2) the square of the highest factor loading approaches the communality. The latter criterion requires almost all of the common factor variance to be explained by the factor to which the individual is assigned. If neither of these criteria can be met, subjects could be assigned to the Mixed Type. Significant differences in overt teaching behaviors might have been observed if individuals loading almost equally on the two factors had been placed in a third category.

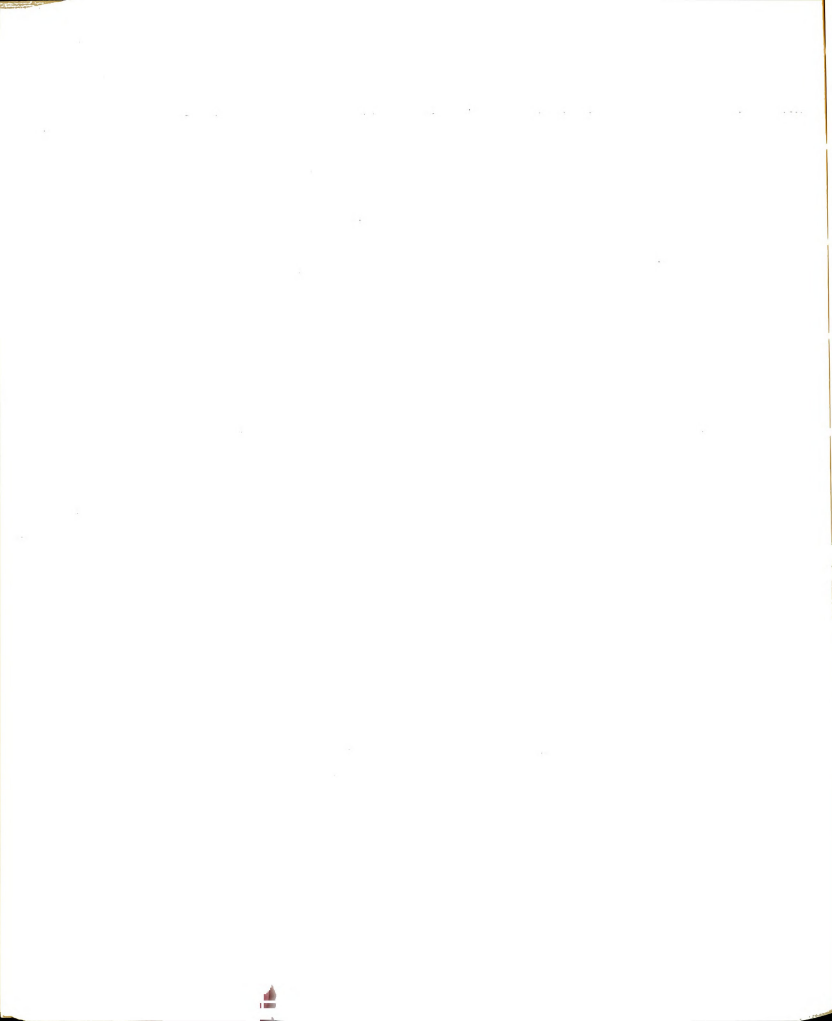
Numerous limitations noted previously suggest other possibilities for classroom observation research. More control of observers and methods of observing would be gained by drawing a random sample of subjects, reducing the number of observers and increasing the amount of observation time. Each observer could record behaviors of each teacher included in the sample, perhaps by using



video tapes of classroom behaviors. Records of verbal behavior should be included in the observations to provide more complete records of classroom behaviors.

This study demonstrated that teaching is a multi-dimensional activity. The five factors identified accounted for only 25% of the total variance; hence much of the teaching-learning situation was not described. Research is needed to determine other significant components of teaching.

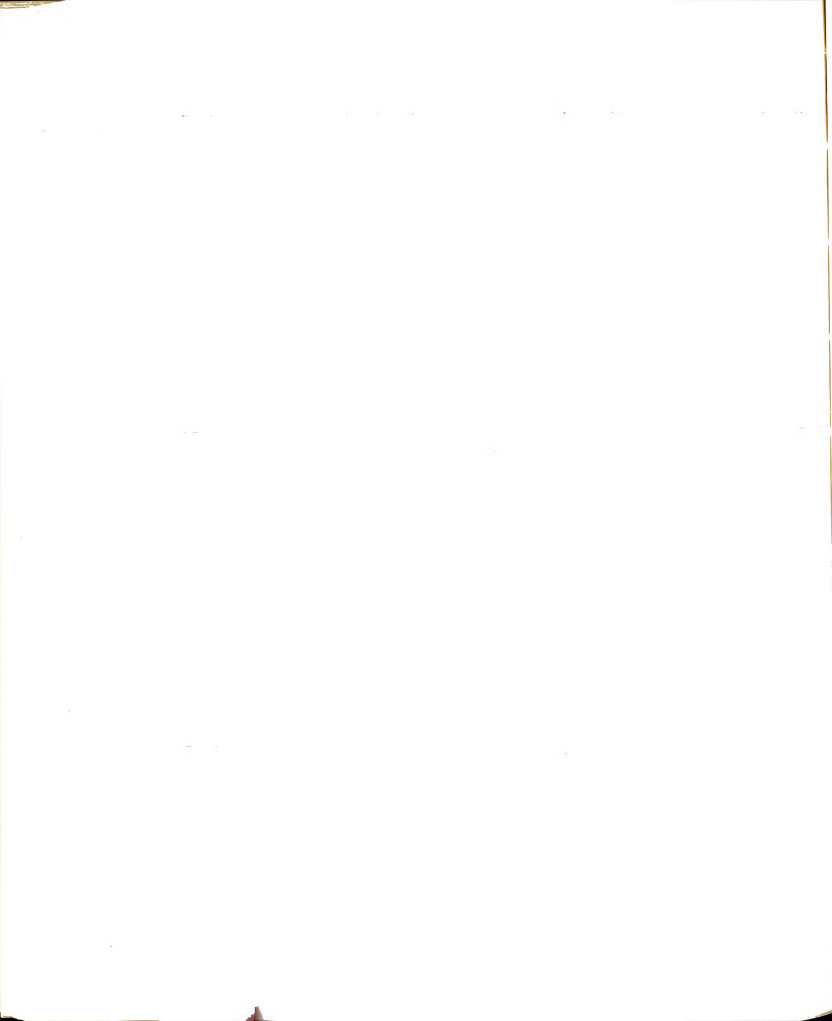
Two interesting relationships were observed in the Supportive and Hostile learning environments across the four teaching levels. Supportive classroom settings were observed least often in Special Education and early elementary classes were seen more often in Grades 3-5, and most of all in upper elementary levels. However, the reverse situation was true of Hostile learning environments. Frequency of occurrence decreased as grade level increased. Is this the result of the socialization process? Is more control necessary in Special Education and primary classes in order to condition the pupils to "appropriate social" behaviors? As overt hostility decreases, does covert hostility increase? Does hostility



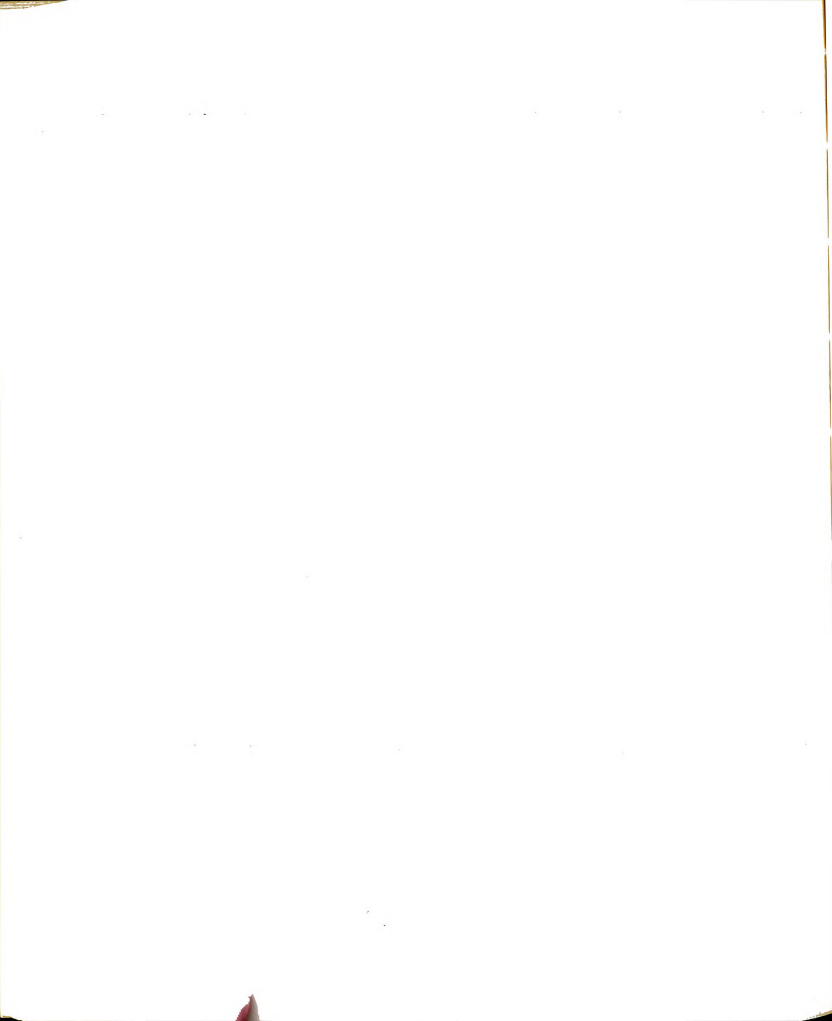
reach its peak among college students though in a suppressed form?

Personality type, sex, and teaching level were the only independent variables investigated in this project. Age and marital status of the teacher, socioeconomic status of both teacher and pupils, location of the school (inner city, urban, suburban, or rural) could also be related to learning environments observed in elementary school classrooms. Further research might well include any or all of these additional variables.

Elementary school teaching seems to be in transition. Learning environments in "classrooms of the future" may differ radically from the five types identified in this project. Observation recording forms which appear appropriate today may lose validity and reliability simply because the behaviors included seldom occur. Five-year and ten-year longitudinal studies of a random sample of teachers included in this investigation could provide data on the nature of the change in teaching-learning environments of elementary schools and the changes that occur in teacher-behaviors over time.



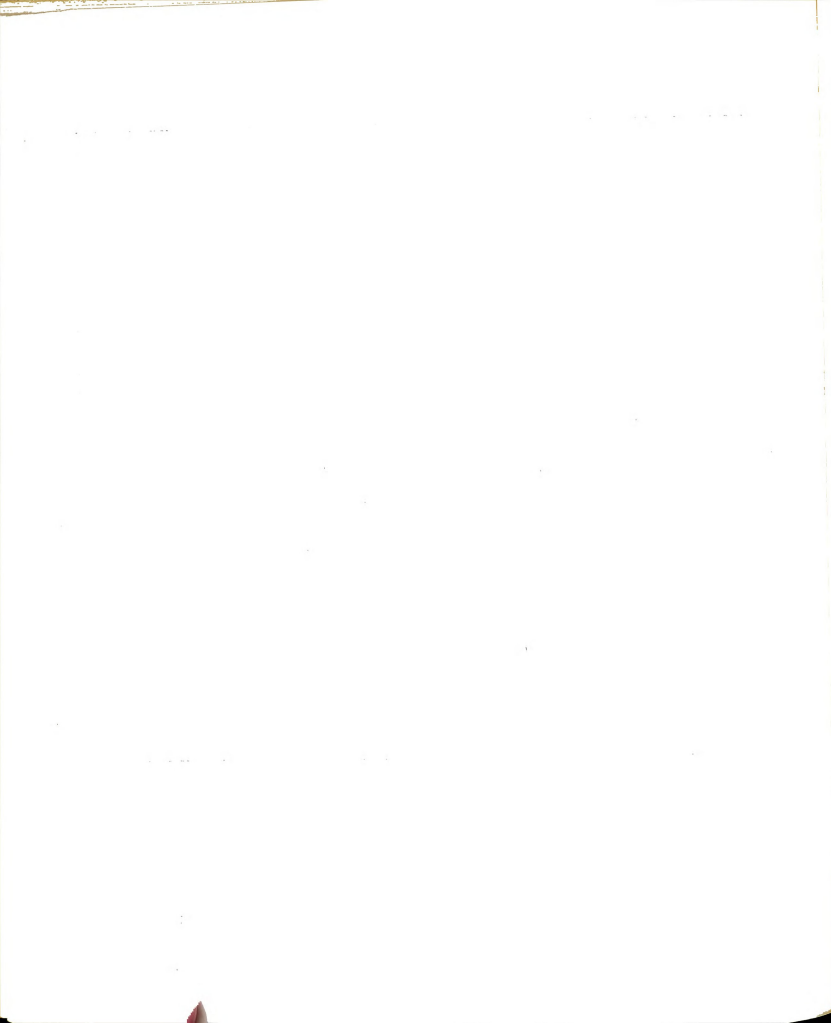
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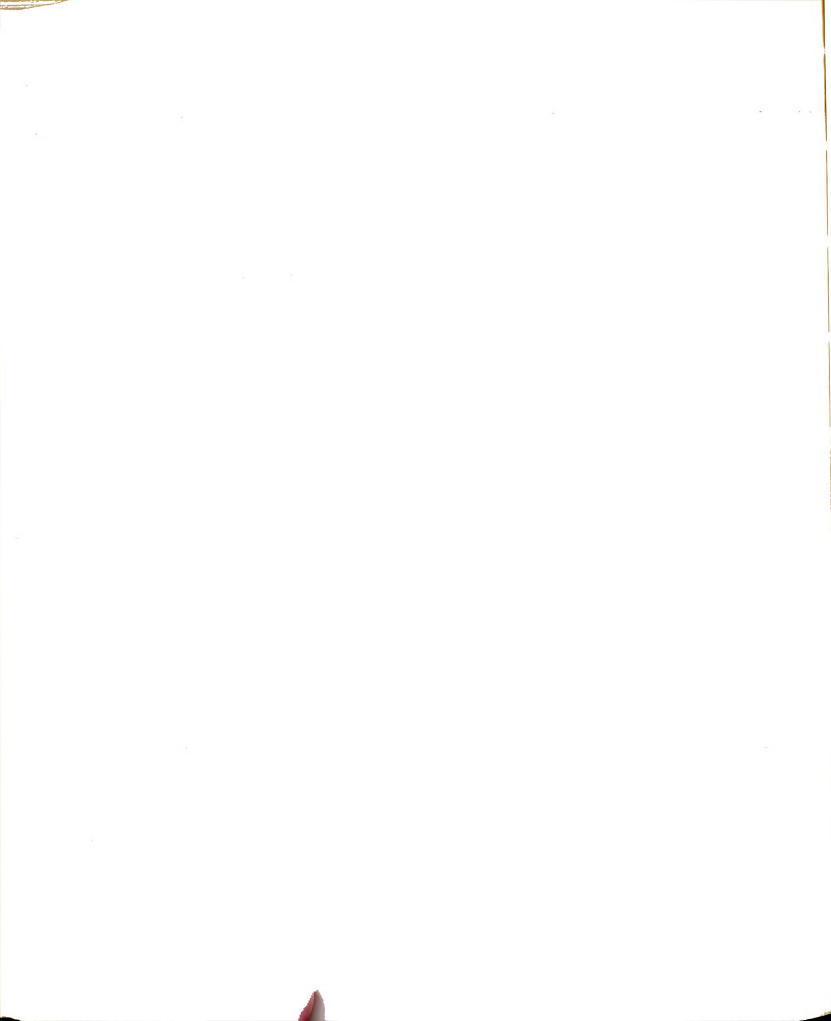
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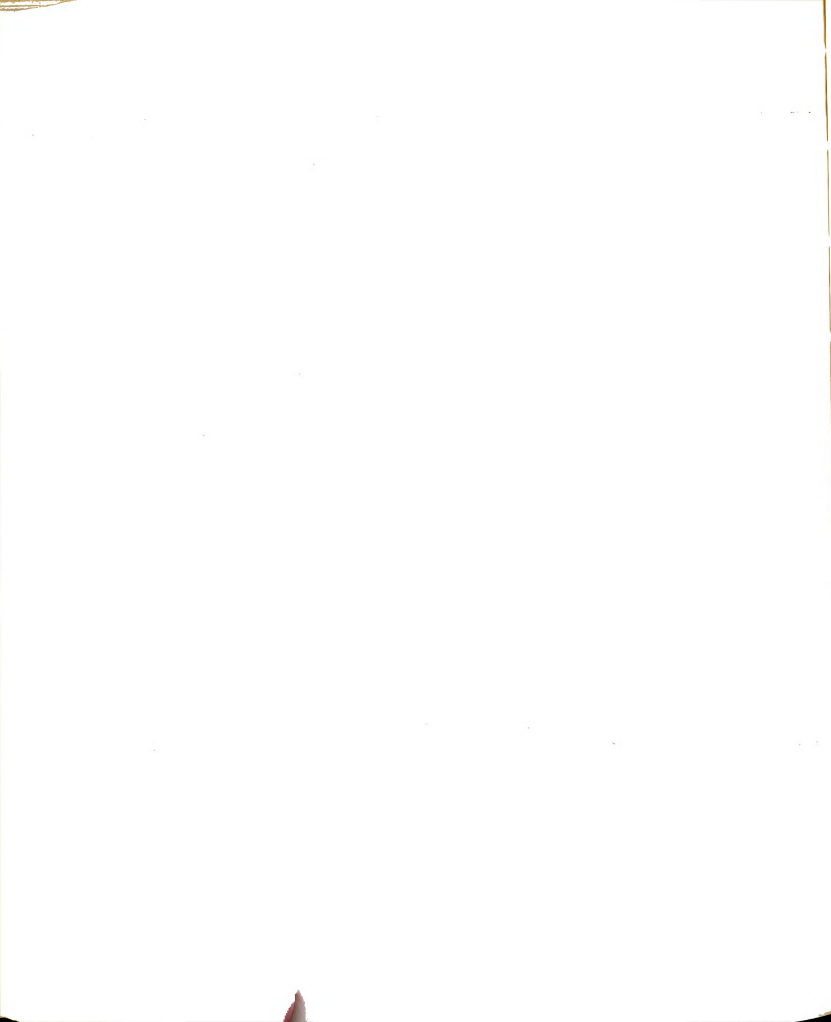
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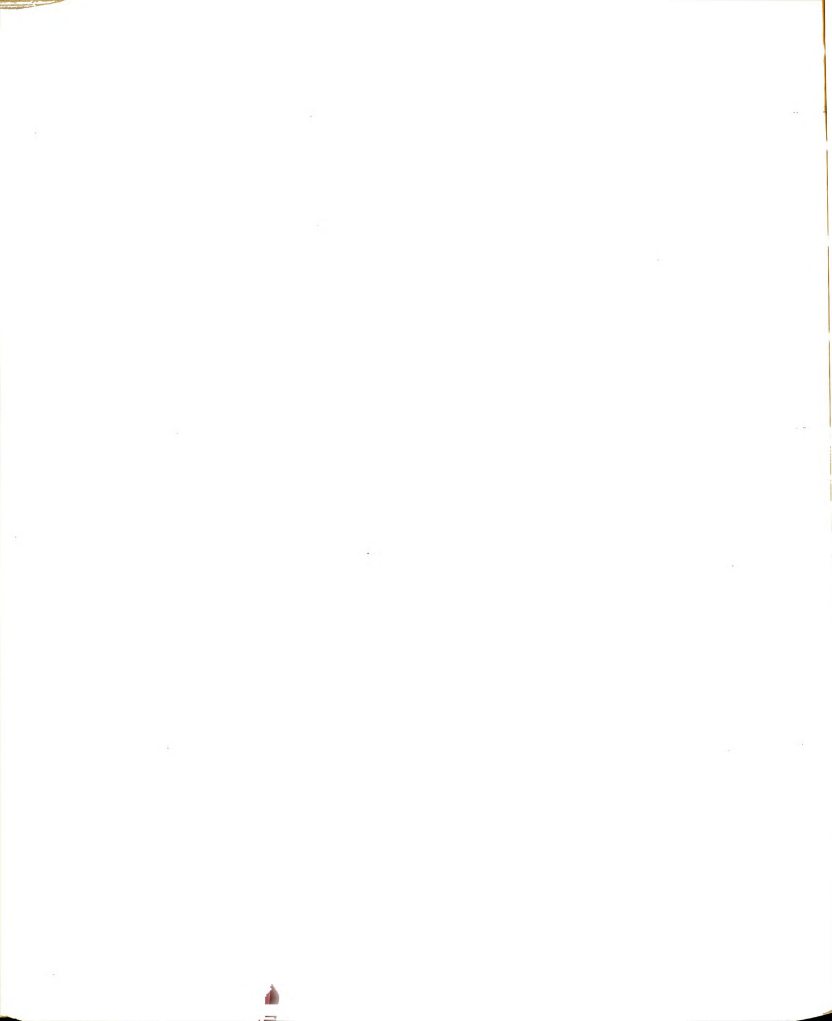


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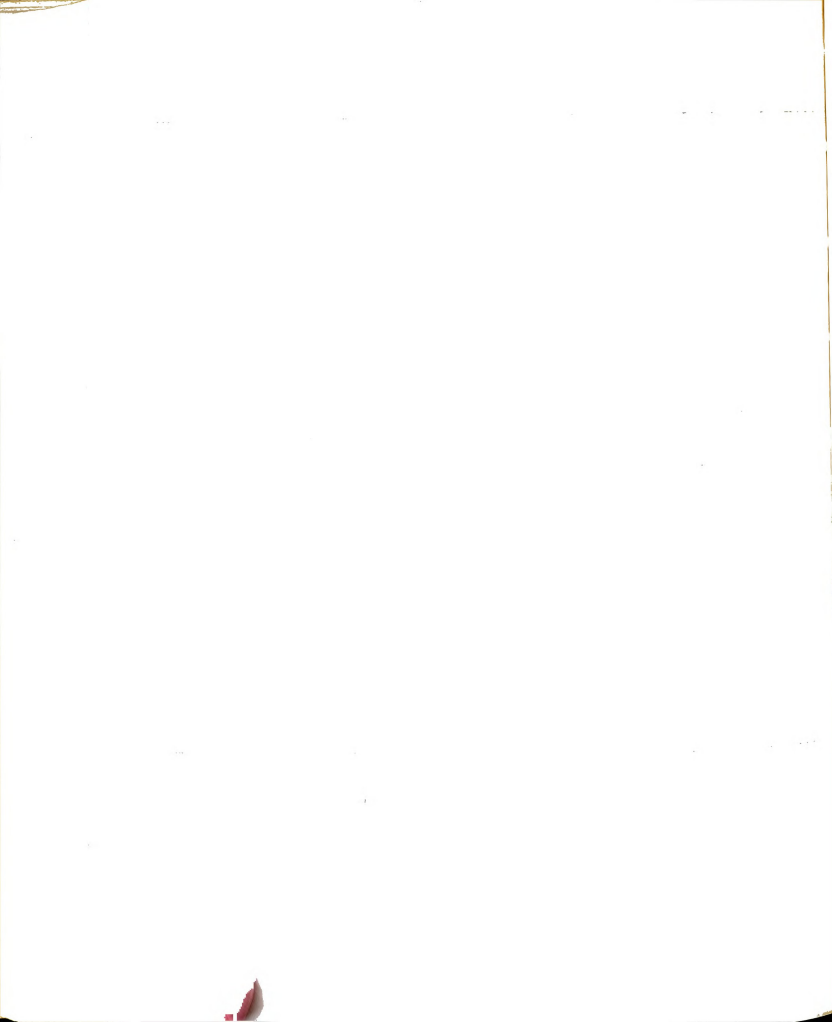


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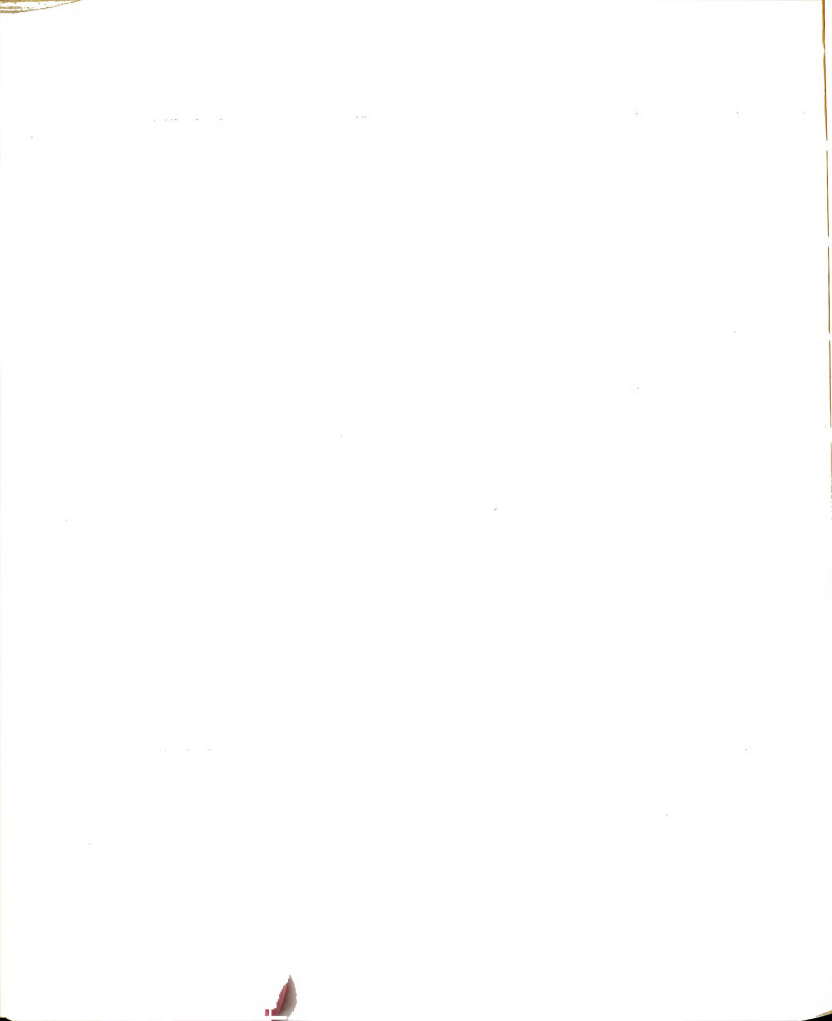
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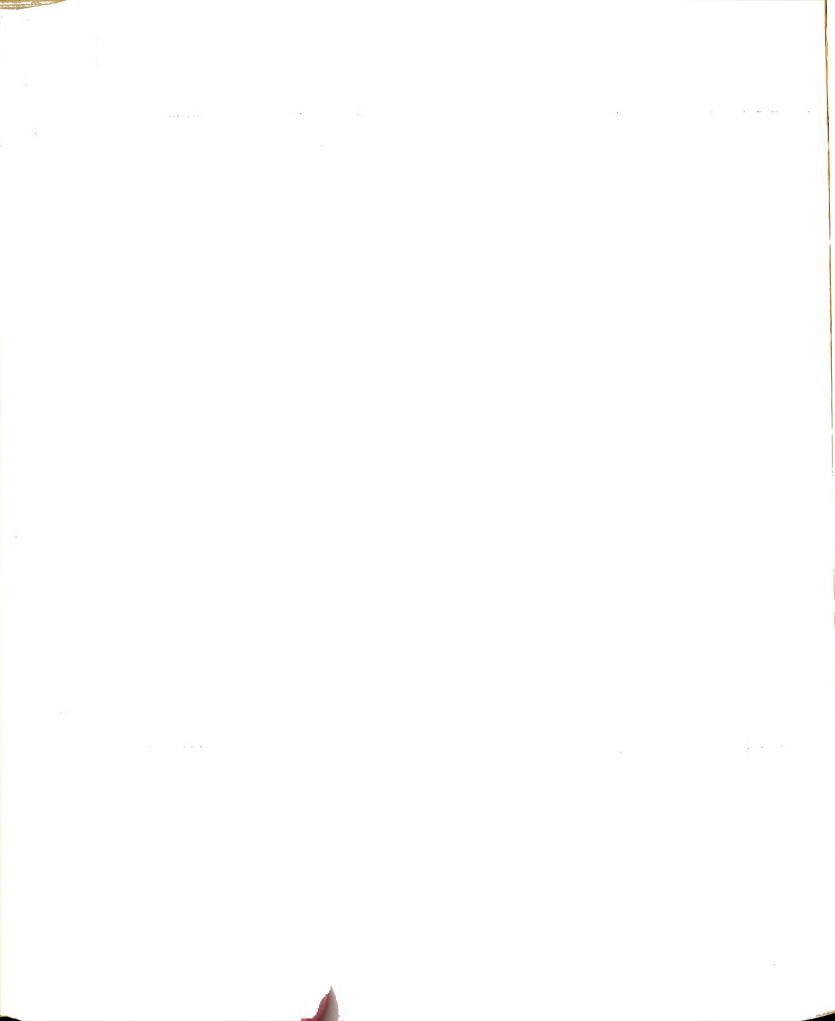
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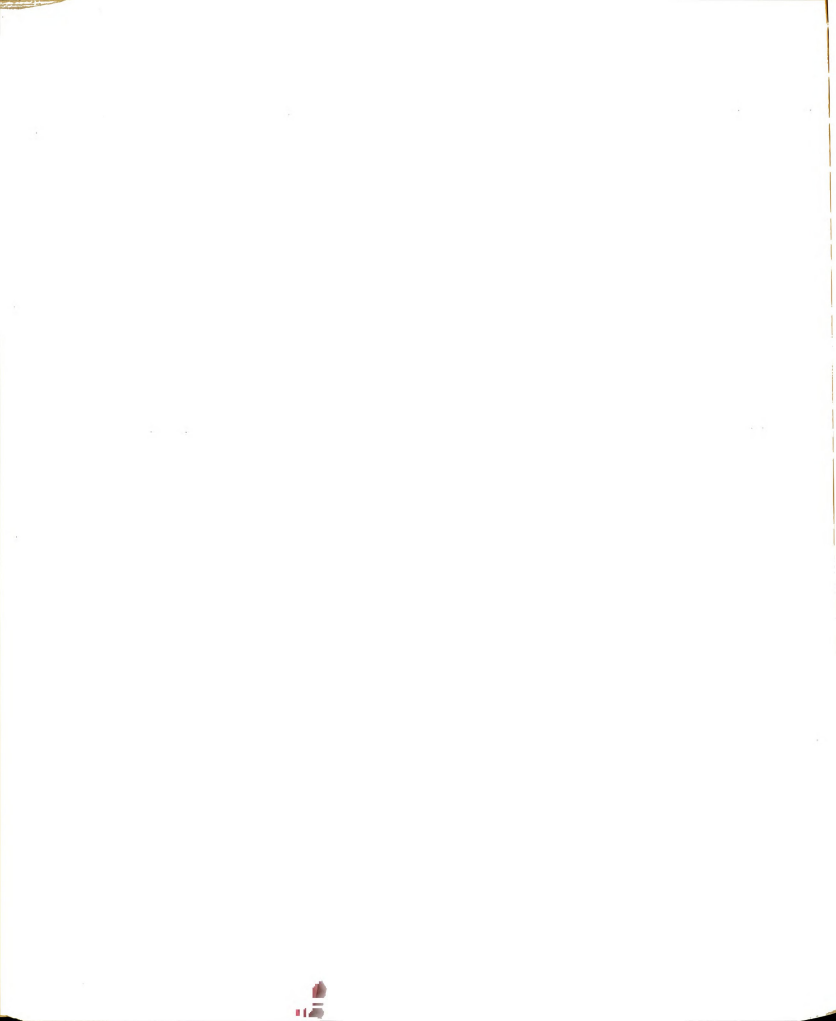


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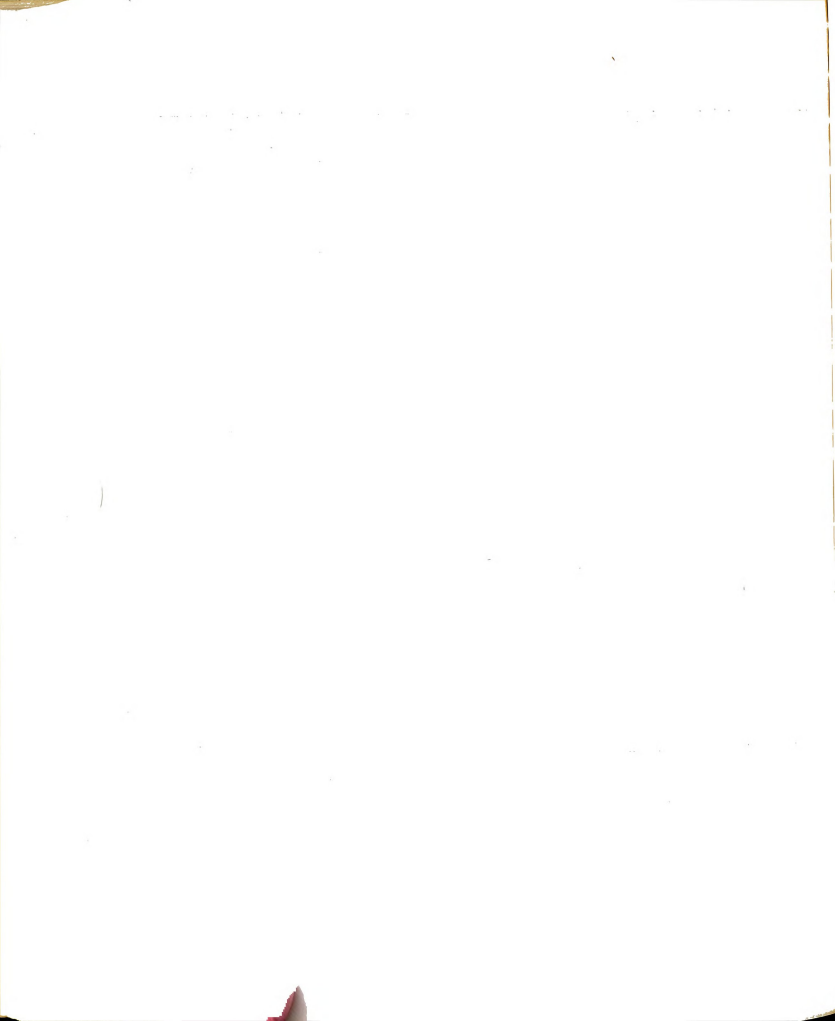
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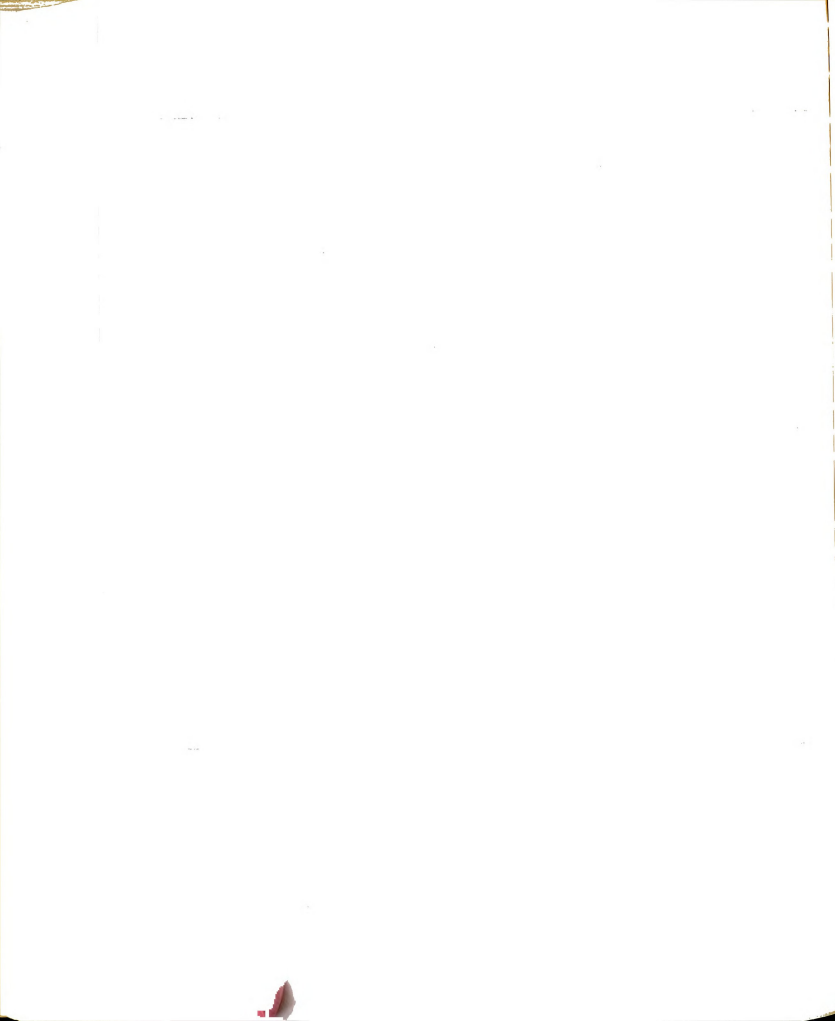
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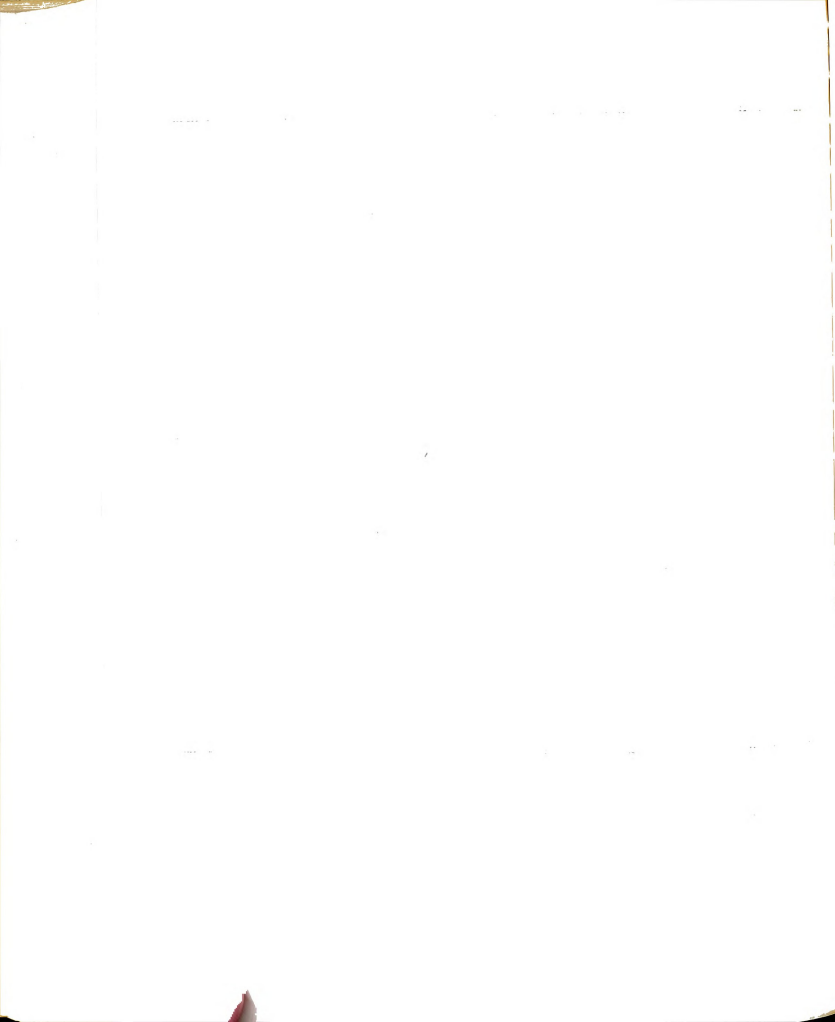


APPENDIX A

THE MANIFEST NEEDS ASSOCIATED WITH EACH OF

THE FIFTEEN EDWARDS PERSONAL PREFERENCE

SCHEDULE VARIABLES



APPENDIX A

THE MANIFEST NEEDS ASSOCIATED WITH EACH OF

THE FIFTEEN EDWARDS PERSONAL PREFERENCE

SCHEDULE VARIABLES*

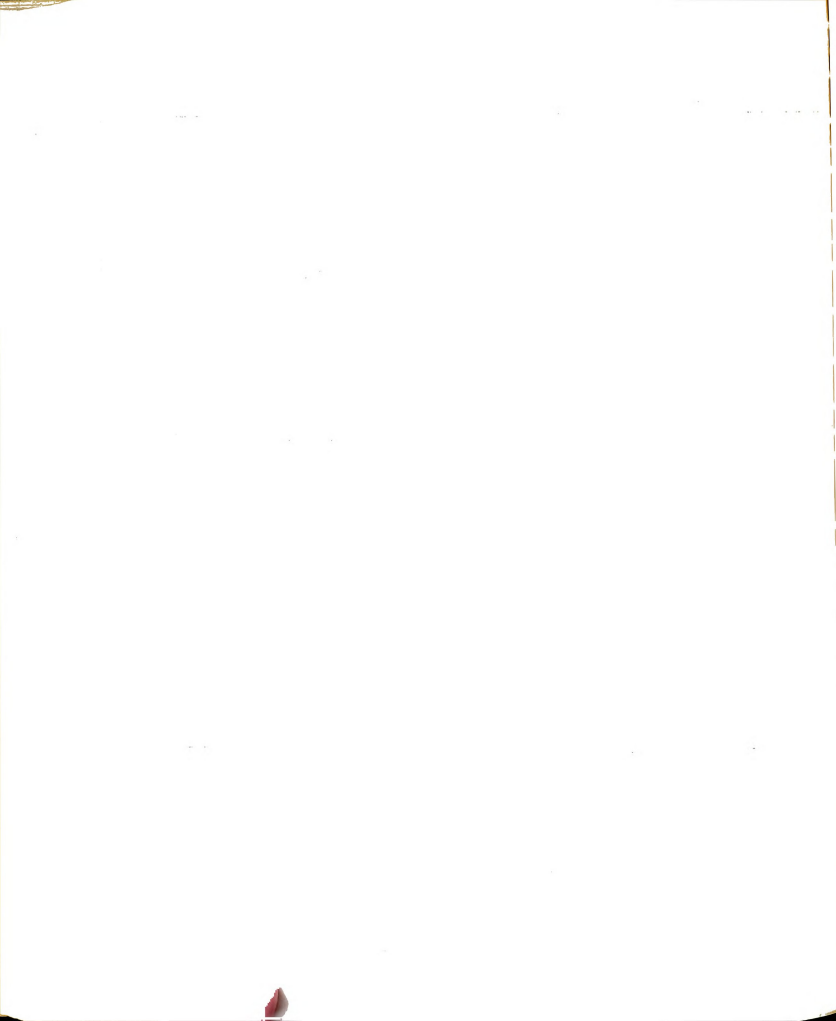
1. Achievement - To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play.

2. Deference - To get suggestions from others, to find out what others think, to follow instructions and do what is expected, to praise others, to tell others that they have done a good job, to accept the leadership of others, to read about great men, to conform to custom and avoid the unconventional, to let others make decisions.

3. Order - To have written work neat and organized, to make plans before starting on a difficult task, to have things organized, to keep things neat and orderly, to make advance plans when taking a trip, to organize details of work, to keep letters and files according to some system, to have things arranged so that they run smoothly without change, to have meals organized and a definite time for eating.

4. Exhibition - To say witty and clever things, to tell amusing jokes and stories, to talk about personal

*A. L. Edwards, Edwards Personal Preference Schedule: Manual (New York: The Psychological Corporation, 1953), 11.



adventures and experiences, to have others notice and comment upon one's appearance, to say things just to see what effect it will have on others, to talk about personal achievements, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannot answer.

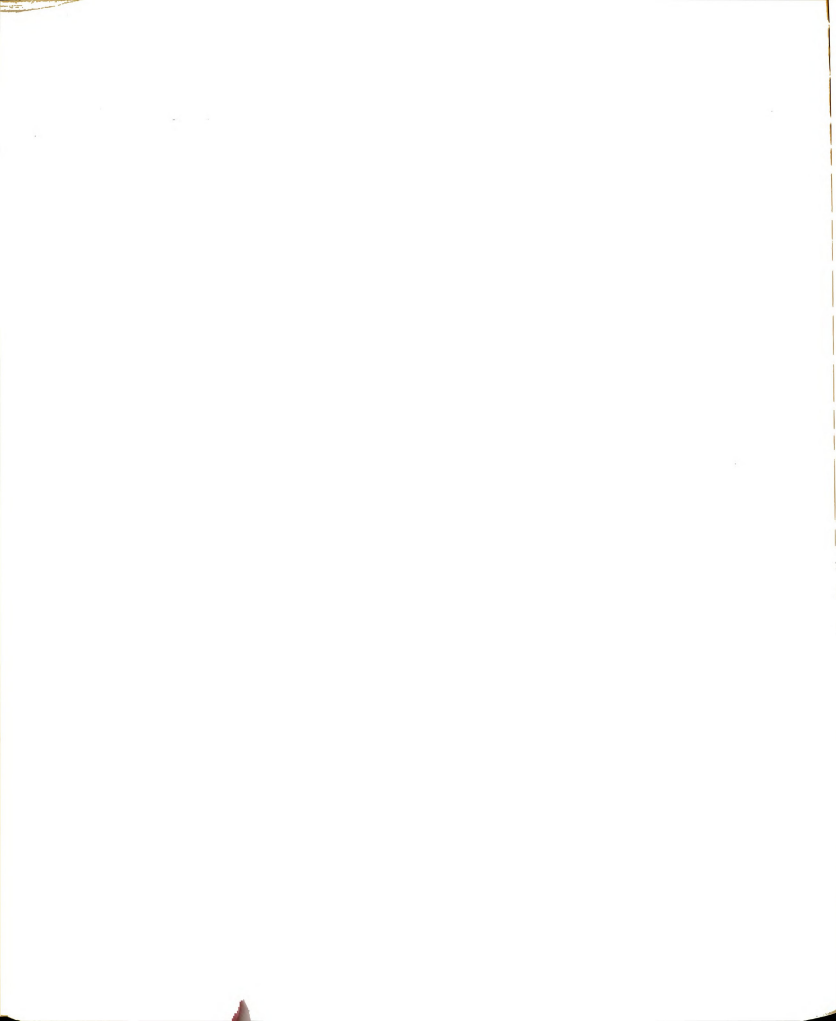
5. Autonomy - To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in positions of authority, to avoid responsibilities and obligations.

6. Affiliation - To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships, to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends.

7. Intracception - To analyze one's motives and feelings, to observe others, to understand how others feel about problems, to put one's self in another's place, to judge people by why they do things rather than by what they do, to analyze the motives of others, to predict how others will act.

8. Succorance - To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sympathetic and understanding about personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt.

9. Dominance - To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and



influence others to do what one wants, to supervise and direct the actions of others, to tell others how to do their jobs.

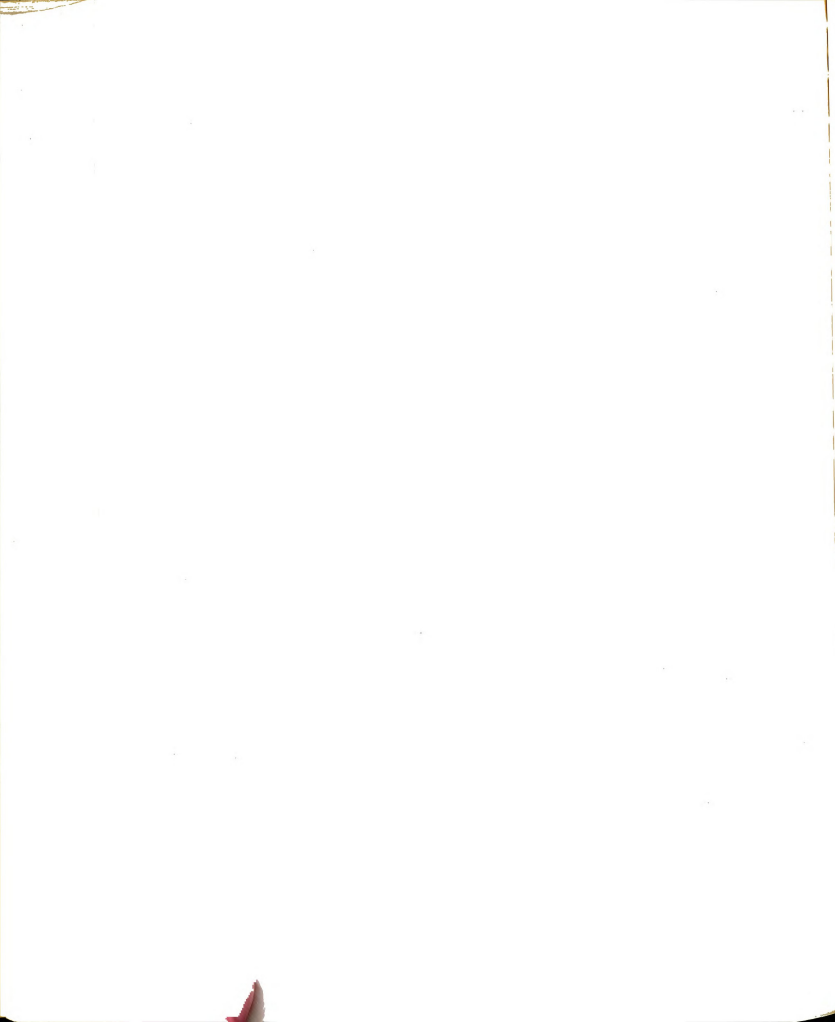
10. Abasement - To feel guilty when one does something wrong, to accept blame when things do not go right, to feel that personal pain and misery suffered does more good than harm, to feel the need for punishment for wrong doing, to feel better when giving in and avoiding a fight than when having one's own way, to feel the need for confession of errors, to feel depressed by inability to handle situations, to feel timid in the presence of superiors, to feel inferior to others in most respects.

11. Nurturance - To help friends when they are in trouble, to assist others less fortunate, to treat others with kindness and sympathy, to forgive others, to do small favors for others, to be generous with others, to sympathize with others who are hurt or sick, to show a great deal of affection toward others, to have others confide in one about personal problems.

12. Change - To do new and different things, to travel, to meet new people, to experience novelty and change in daily routine, to experiment and try new things, to eat in new and different places, to try new and different jobs, to move about the country and live in different places, to participate in new fads and fashions.

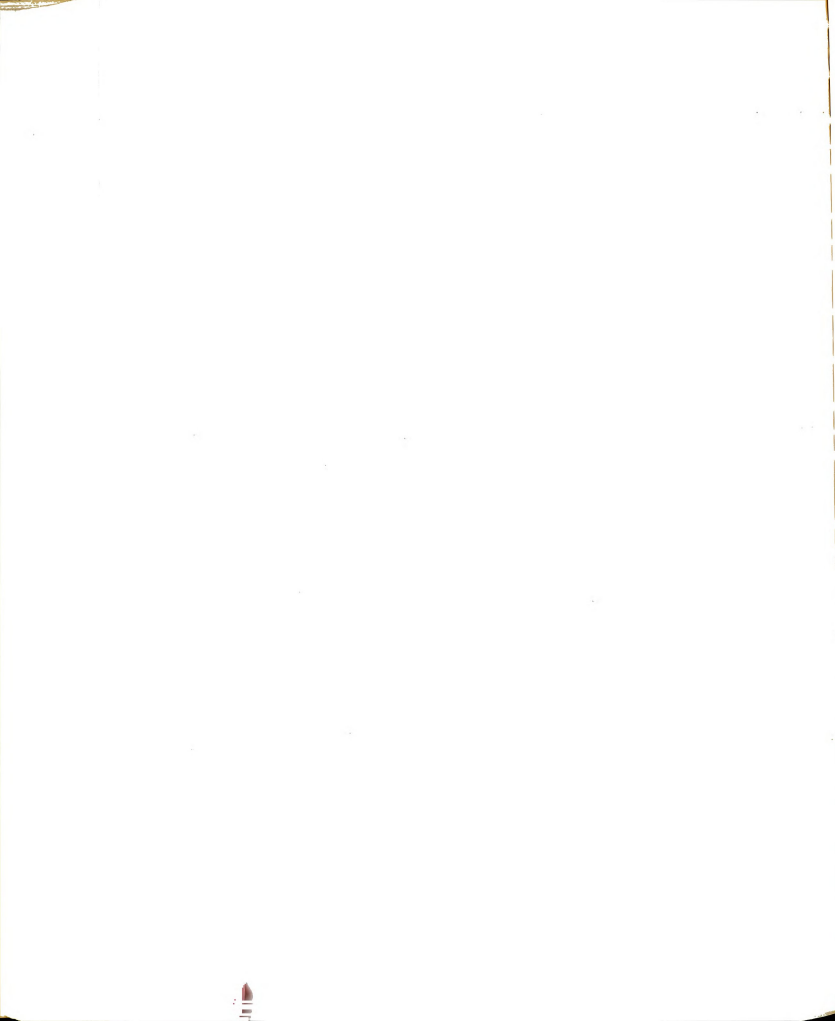
13. Endurance - To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work.

14. Heterosexuality - To go out with members of the opposite sex, to engage in social activities with the opposite sex, to be in love with someone of the opposite sex, to kiss those of the opposite sex, to be regarded as physically attractive by those of the opposite



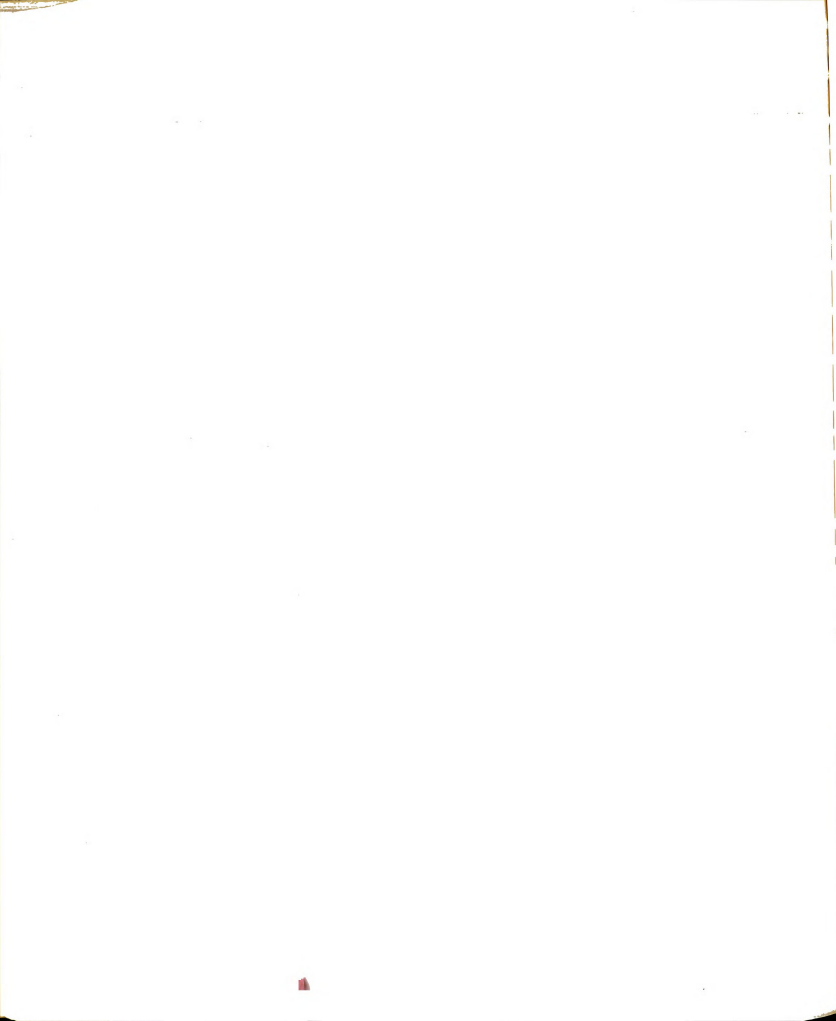
sex, to participate in discussions about sex, to read books and plays involving sex, to listen to or to tell jokes involving sex, to become sexually excited.

15. Aggression - To attack contrary points of view, to tell others what one thinks about them, to criticize others, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence.



APPENDIX B

ROKEACH DOGMATISM SCALE (SHORT FORM)



APPENDIX B

ROKEACH DOGMATISM SCALE (SHORT FORM)

DIRECTIONS: You will read below some statements people have made as their opinion on several topics. You may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others. Whether you agree or disagree with any statement, you can be sure that many other people feel the same as you do.

We want your personal opinion on each statement. When you read each one, first indicate whether, in general, you agree or disagree with it:

In column I mark (+) or (-):

+ = agree

- = disagree

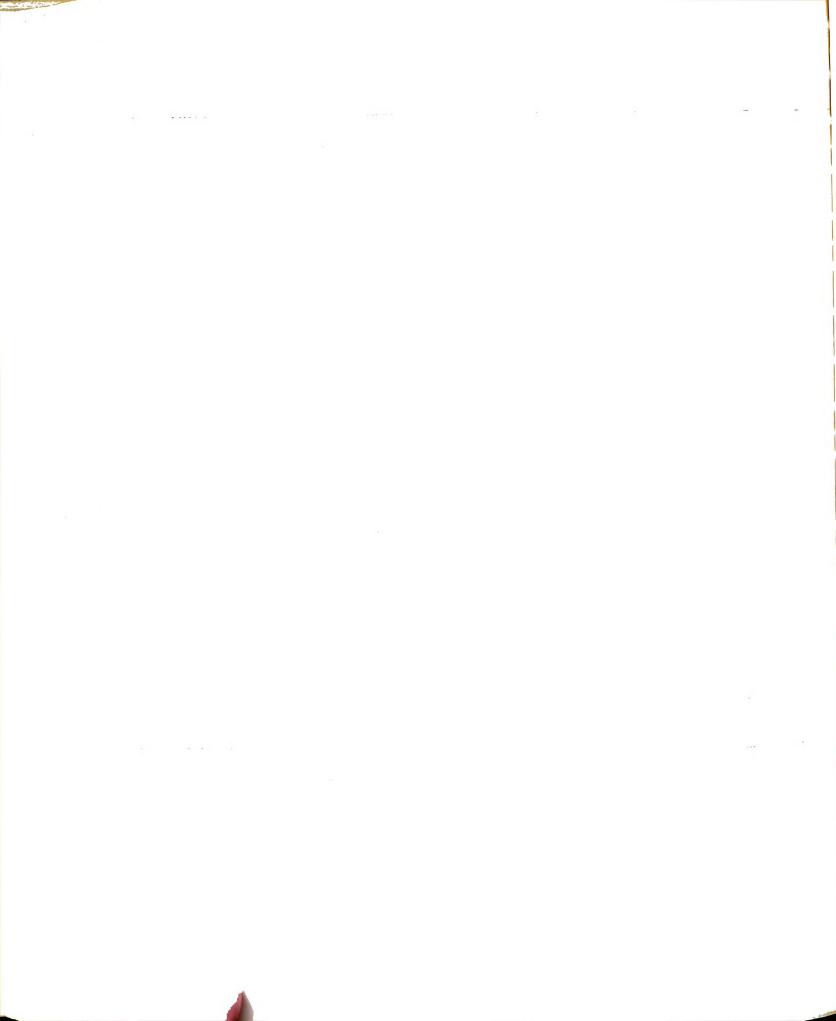
Then indicate how strongly you agree or disagree:

In column II mark 1, 2, or 3:

- | Agree | Disagree |
|-----------------------|--------------------------|
| 1. Agree a little | 1. Disagree a little |
| 2. Agree on the whole | 2. Disagree on the whole |
| 3. Agree very much | 3. Disagree very much |

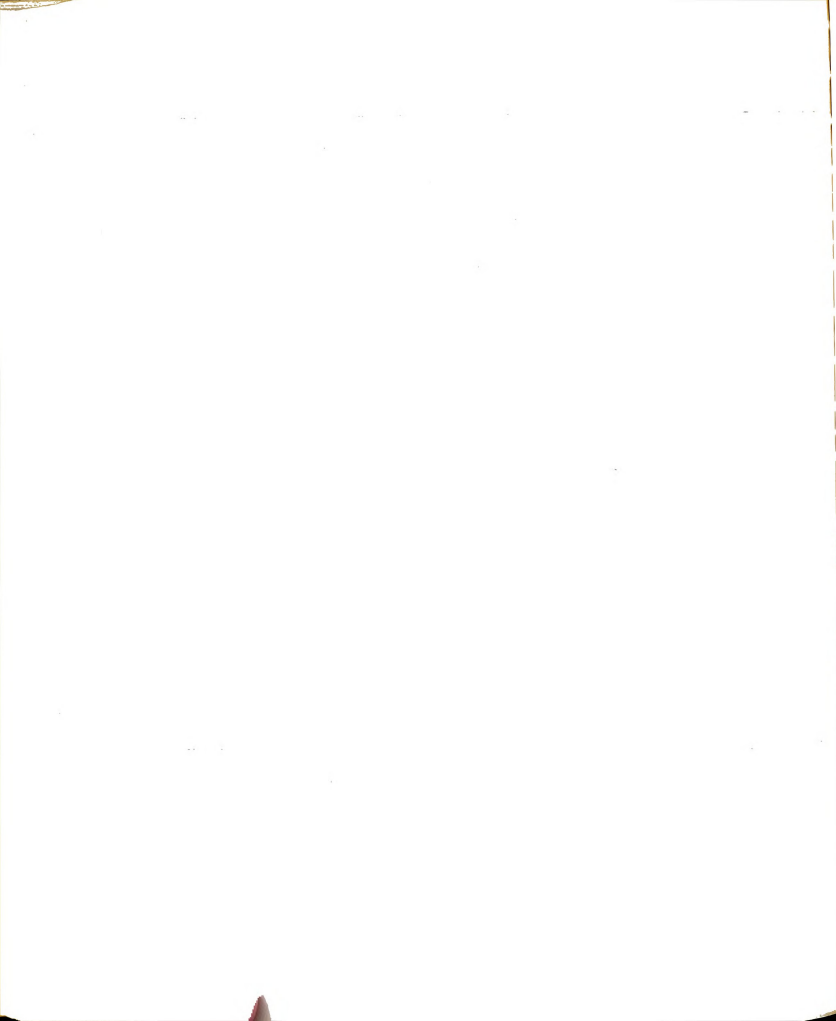
I II

- | | |
|--------|--|
| — — | 1. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted. |
| — — | 2. My blood boils whenever a person stubbornly refuses to admit he's wrong. |



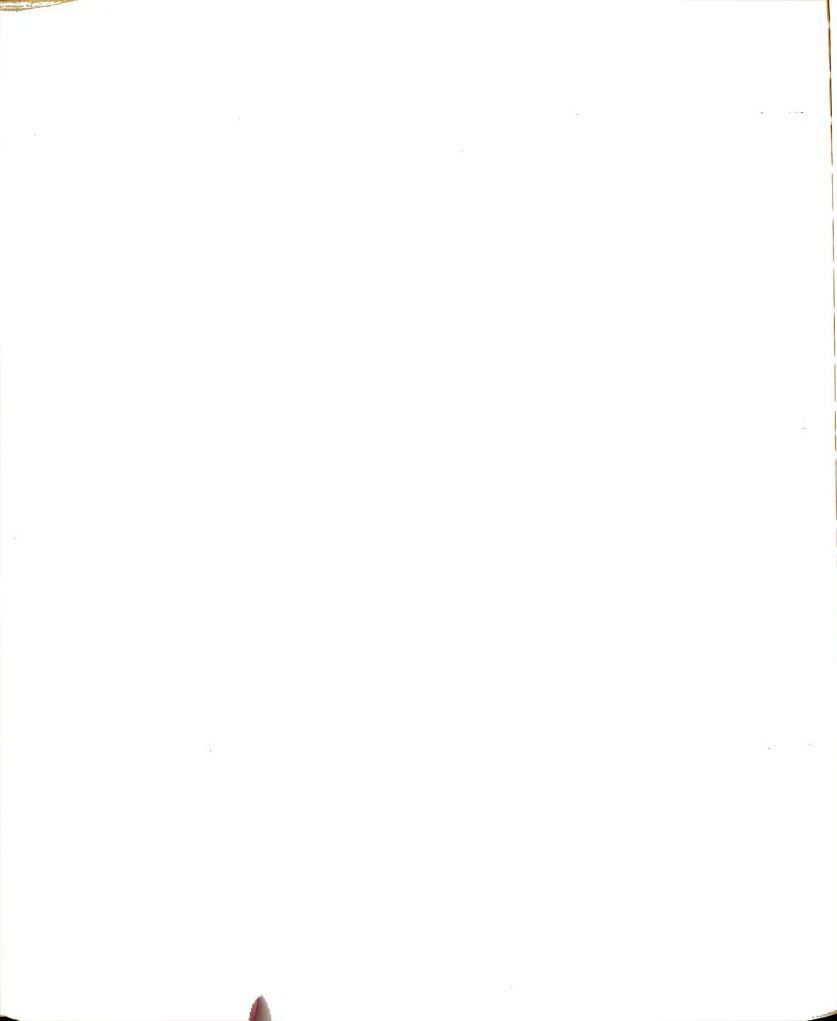
I II

- — 3. There are two kinds of people in this world: those who are for the truth and those who are against the truth.
- — 4. Most people just don't know what's good for them.
- — 5. Of all the different philosophies which exist in this world there is probably only one which is correct.
- — 6. The highest form of government is a democracy and the highest form of democracy is a government run by those who are most intelligent.
- — 7. The main thing in life is for a person to want to do something important.
- — 8. I'd like it if I could find someone who would tell me how to solve my personal problems.
- — 9. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.
- — 10. Man on his own is a helpless and miserable creature.
- — 11. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.
- — 12. Most people just don't give a "damn" for others.
- — 13. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.
- — 14. It is often desirable to reserve judgment about what's going on until one has had a chance to hear the opinions of those one respects.
- — 15. The PRESENT is all too often full of unhappiness. It is only the FUTURE that counts.
- — 16. The United States and Russia have just about nothing in common.
- — 17. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.



I II

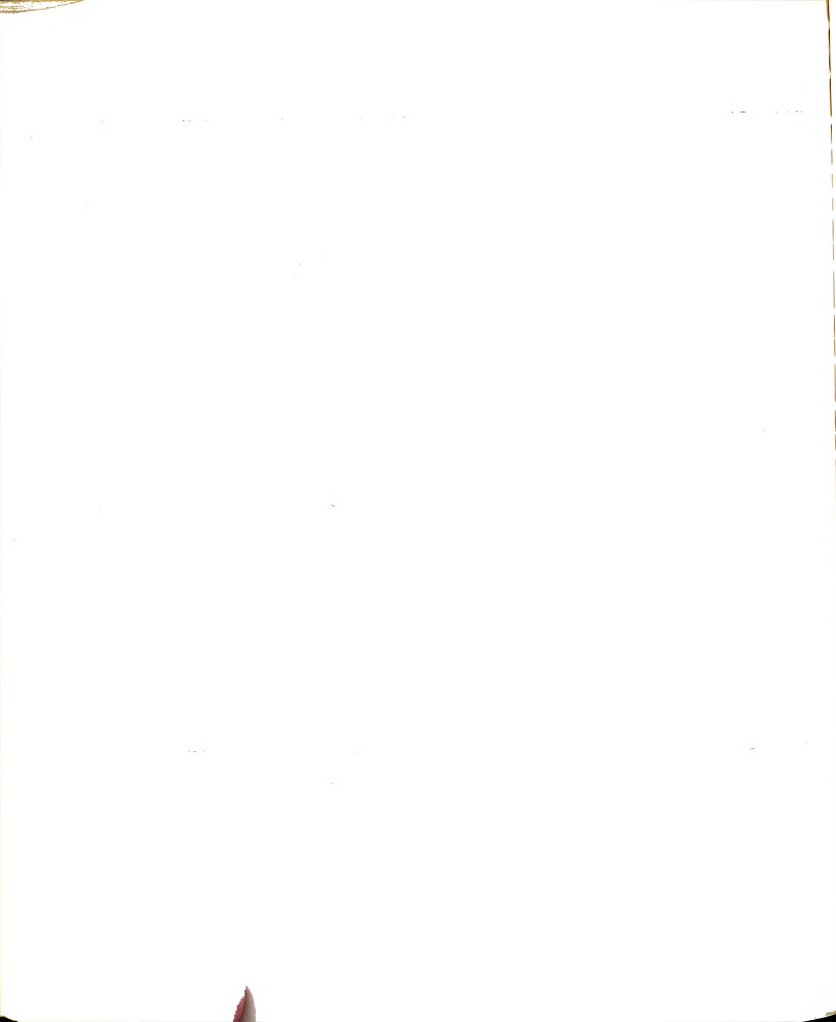
- — 18. While I don't like to admit this even to myself, my secret ambition is to become a great man, like Einstein, or Beethoven, or Shakespeare.
- — 19. Even though freedom of speech for all groups is a worthwhile goal, it is unfortunately necessary to restrict the freedom of certain political groups.
- — 20. It is better to be a dead hero than to be a live coward.



APPENDIX C

OBSERVATION SCHEDULE AND RECORD (OSCAR III)

MANUAL AND RECORDING FORM



APPENDIX C

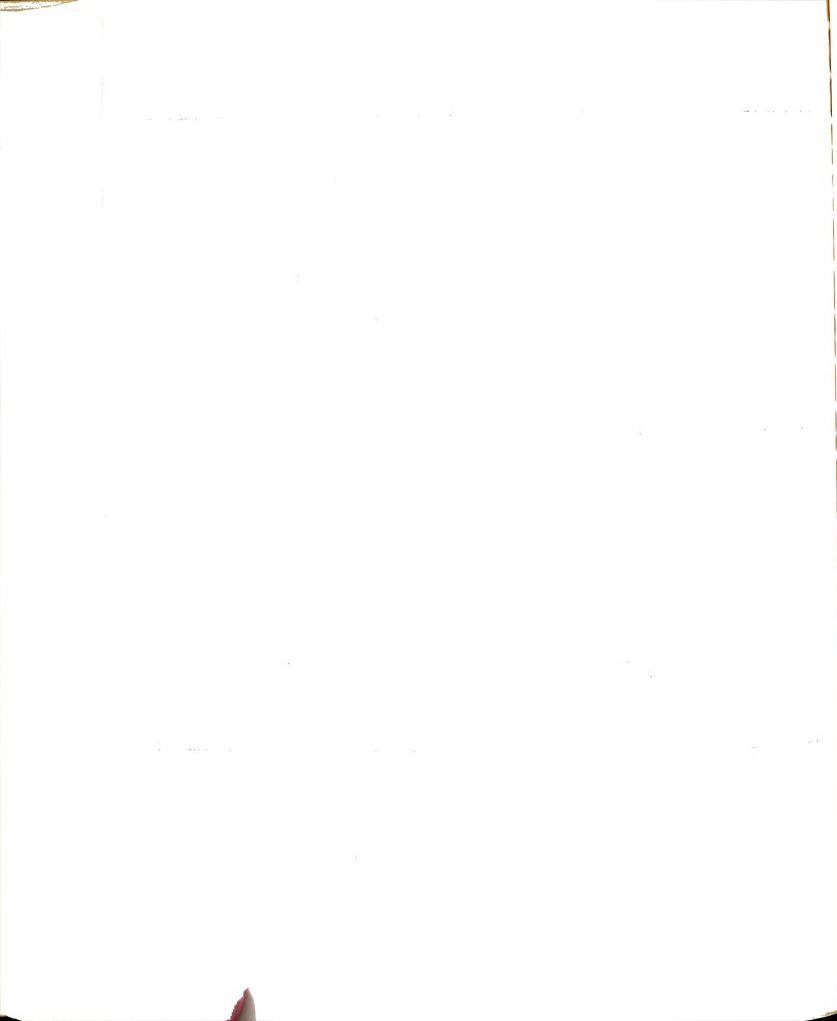
OBSERVATION SCHEDULE AND RECORD (OSCAR III)

MANUAL AND RECORDING FORM

Historical Development

Originally, the Observation Schedule and Record (OSCAR) was designed by Medley and Mitzel to provide quantitative data regarding classroom behaviors of beginning teachers. Items constructed by Cornell, Lindvall, and Saupe (1952) and Withall (1949) were modified and combined to form OSCAR 2a. This classroom observation instrument differs from its predecessors in three ways:

1. Observer accuracy is increased. Specific behavioral cues requiring little or no judgment on the part of the observer are employed. Hence relatively untrained observers can use the OSCAR easily.
2. Observations are made by a single observer visiting a classroom by himself. A score based on simultaneous observations by two observers of a teacher contains less information than an average score based on observations made by two observers who see a teacher at different times. In the latter case, the behavior sample is doubled.
3. The process of scoring is separated from the process of observing. The observer is asked to record any possibly significant behaviors that occur; he does not judge their relationship to any dimension or scale.



OSCAR III includes items concerning teacher and pupil activities and relationships, grouping, materials used, and subject content discussed during three separate five-minute intervals. Fifteen groups (lettered A-O) of categories appear on the recording sheet.

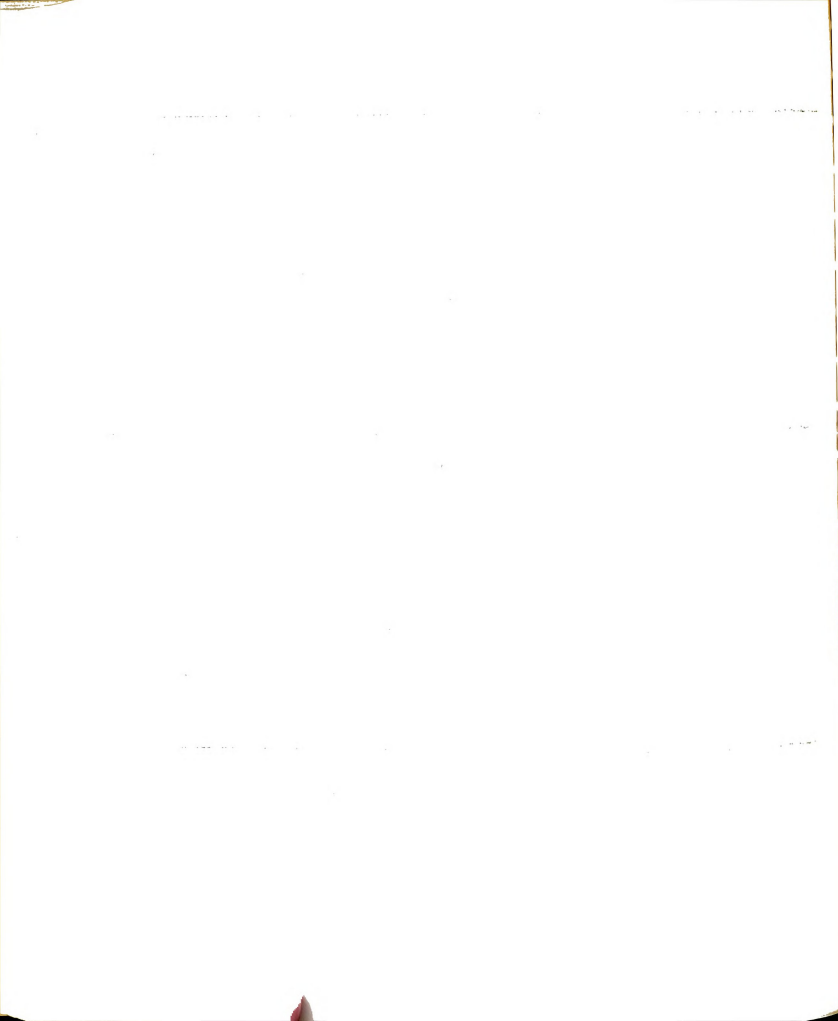
Behaviors are recorded in columns I, III, and V during the corresponding first, third, and fifth five-minute periods in a twenty-five minute observation. Immediately after recording the necessary identification data, the observer starts his stopwatch and checks in the appropriate row and column each different activity or behavior which occurs during the particular observation interval. Note that any category on this observation sheet is checked only once for each five-minute period regardless of the number of times the activity or behavior occurs during the observation period.

Definition and Explanation of Categories

Group A: Teacher-Pupil

1. Teacher questions, pupil answers. The teacher's question may be either direct or implied. However, it must be a question for which an answer is expected, that is, the teacher must pause long enough for an appropriate answer to be given. The question cannot be rhetorical. A teacher calls on a pupil, points to a pupil, or in another way indicates that a pupil is to respond. A statement such as, "I don't know," or an incorrect answer, in this case, constitutes an answer. If the pupil ignores the question, category 4 of group D should be checked. This category differs from categories 1, 2, and 3 of group E in that, in this category, the questions require only brief answers or comments (thus different from E1 and E3) which are not dependent upon memorization by rote (thus different from E2).

Some examples of questions in this category are,
 "Billy, did you pass your paper to the front of the room,"
 "Jane, which spelling word did you have the most



difficulty learning," or, "Bob, do you understand how Jimmy worked this problem."

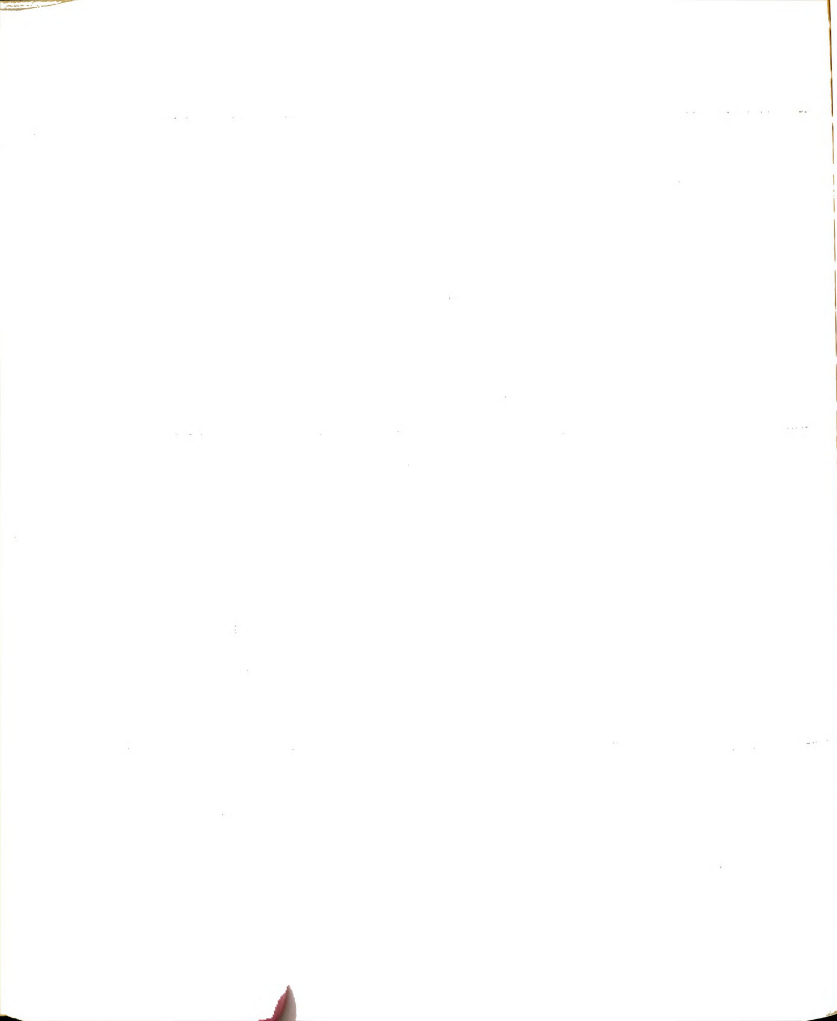
2. Teacher answers pupil's question. As in A1, the question may be either direct or implied, however, it must be a question for which an answer is expected (see A1). If the teacher ignores the question, category 4 of group A should be checked.

3. Teacher interrupts pupil. This category is checked when the teacher speaks while a pupil is speaking regardless of the reason for the interruption, e.g., for clarification, additional information, change of topic, or correction.

4. Teacher ignores pupil's question. This category is checked whenever the teacher, either deliberately or inadvertently, ignores, or does not answer or comment on a question by a pupil, provided that the pupil expects an answer to the question (see A1) and that the question is asked in such a way that it is, in all probability, audible to the teacher. This category is checked regardless of the occasion during which the question is asked, for example, during a test.

5. Teacher warns or threatens pupil or pupils. This must be a verbal threat or warning and the threat or warning must be explicit in the statement of the teacher. A threat or warning would ordinarily take the form, "If A does (doesn't) do X then Y (will happen)." More specifically, "If you don't get the problems finished before class is dismissed you will stay after school."

6. Teacher uses criticism and/or sarcasm. This category includes scorn, ridicule, or (contemptuous) laughter, but the statement or the laughter must be such that the content, the context, or the manner of expression explicitly indicates or portrays criticism, sarcasm, scorn, or ridicule. Academic correction, e.g., three times four is twelve not nine are not included in this category unless criticism for not knowing the correct answer, or sarcasm, accompanies the correction.



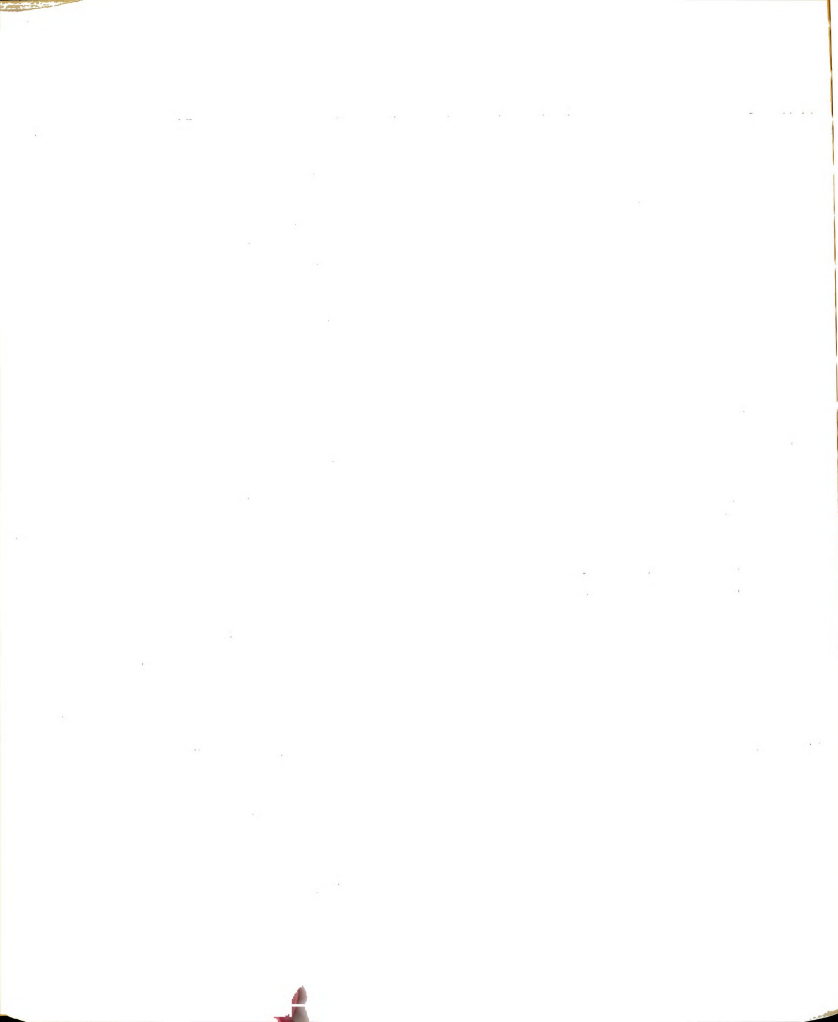
7. Teacher praises and/or encourages pupil or pupils for good work. The praise or the encouragement may take the form of a comment or a remark to the individual concerned, e.g., "This is the best arithmetic paper you have submitted this week"; to the class about the individual, e.g., "If the rest of the class did their problems as well as X. . ."; to a specified part of the class, e.g., "Those of you who solved problem five correctly have learned the multiplication tables well"; or to the entire class, e.g., "All of you must have studied very hard to have learned the multiplication tables so well in such a short time." This category is checked when the praise or the encouragement is for a task or an activity well done.

8. Teacher praises and/or encourages pupil or pupils for good behavior. This category is the same as A7 except that the praise or encouragement is for good behavior rather than for good work. Thus, the praise or encouragement may take the form of a comment or a remark to the individual concerned, to the class about the individual, to a specified part of the class, or, to the entire class.

9. Teacher works with individual pupil. This category is checked when the teacher aids an individual pupil regardless of whether the aid is asked for by the pupil and regardless of whether the aid is of an "academic" nature or not (it might, for example, be helping a pupil put on boots or fix a toy).

Group B: Teacher-Class

1. Teacher lectures. This category is checked during the time when the class is conducted in a manner which makes no provision for active pupil participation in the lesson being presented except through some form of intrusion or interruption in the teacher's presentation. If an interruption occurs or should active participation on the part of the pupils be initiated then another category is to be checked (see A2, A4, or B3).



2. Teacher reads, tells story. This category is checked whether the story is told or the passage read by the teacher to clarify or to further elaborate a particular point in a lecture or whether the story or the reading itself is the primary concern of the teacher and the class at the particular time.

3. Teacher talks to class. This category is checked when the teacher is discussing topics of a non-academic nature, for example, running in the hall, good sportsmanship, obeying the school patrol; if the teacher is giving directions to the class, e.g., "Turn to page 41 of your arithmetic books," or when the teacher is answering or asking questions so that there is intermittent pupil participation during the imparting of information.

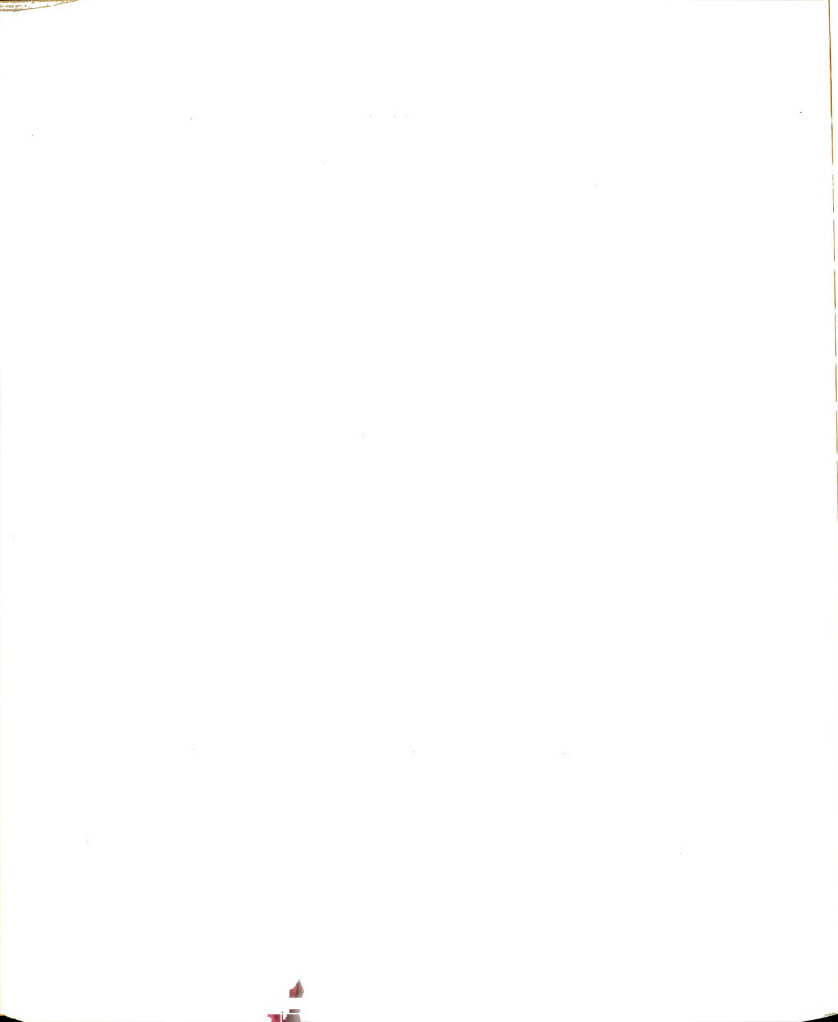
4. Teacher illustrates at board. This category is checked when the teacher uses the blackboard as a means of facilitating explanation, elaboration, clarification, justification, or the imparting of information.

5. Teacher illustrates with map or chart. This category includes the use by the teacher of graphs, pictures, posters, or other pictorial material and is checked when one of these visual aids is used by the teacher as a means of facilitating explanation, elaboration, clarification, justification, or the imparting of information.

6. Teacher demonstrates. This category is checked when the teacher uses a three-dimensional model, object, or specimen as a means of facilitating explanation, elaboration, clarification, justification, or the imparting of information.

7. Teacher shows film, slides, plays records. This category is checked when the teacher for any reason whatsoever, utilizes these particular audio, visual, or audiovisual materials.

8. Teacher passes books, paper, milk. This category is checked whenever the teacher is involved in the distribution or the passing of a book or books, paper, or milk.



9. Teacher leads singing, exercises, or games.

This category is checked when the teacher is actively engaged as the director of singing, drill exercise, or games.

Group C: Teacher Activities

1. Teacher works at desk (or at a temporary location serving as a desk). This category is checked at those times when the teacher is engaged in making out reports, grading papers, composing lesson plans, and similar tasks. Should the teacher temporarily stop this activity in order to help a pupil or pupils, a check should be made in A9 or in some category of Group I or J.

2. Teacher cleans, decorates room. This category is checked when the teacher is actively engaged in cleaning (picking up paper, dusting) or decorating the room.

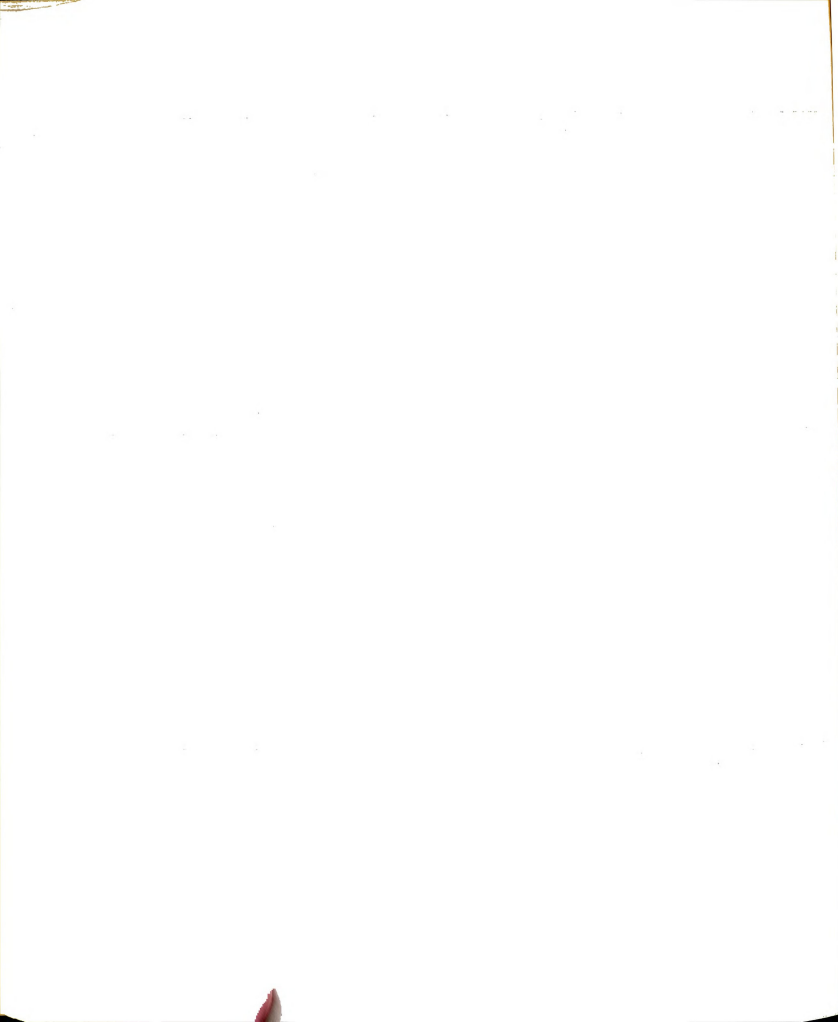
3. Teacher writes on, decorates board. This category is checked whenever the teacher, while the class is busy at some other task, decorates or writes on or posts information on a bulletin board or blackboard. This category is distinct from, and is not to be confused with category 4 of Group B.

4. Teacher leaves, enters room. This category is checked when the teacher leaves or enters the room except for the time when the teacher stands in the doorway or in the hall within sight and hearing of the class.

5. Teacher talks with visitor. This category is checked when the teacher talks to a visitor in the classroom, in the doorway, or in the hall adjacent to the classroom.

Group D: Pupil-Teacher

1. Pupil whispers. This category is checked only when the whispering on the part of the pupil indicates or reflects, by the time and the place of its occurrence,



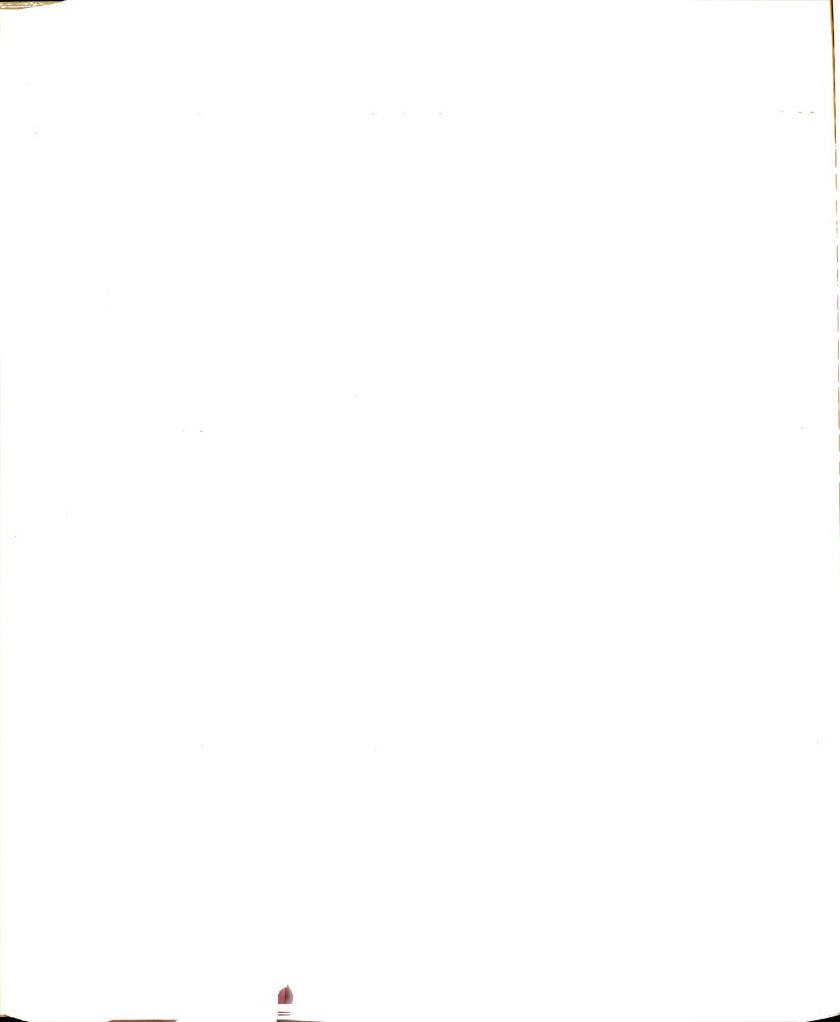
inattention on the part of a pupil or pupils. Thus, this category is checked only when the whispering occurs while the teacher is expecting attention.

2. Pupil laughs. This category is checked only when the laughter is audible and when it indicates or reflects, by the time and the place of its occurrence, inattention on the part of a pupil or pupils. Laughter with the class at an amusing story would, for example, not be included in this category while laughter resulting from the telling of a "private joke" would be included in this category.

3. Pupil interrupts teacher. This category is checked when the pupil speaks while the teacher is speaking regardless of the reason for the interruption, e.g., for clarification, additional information, change of topic, or correction.

4. Pupil ignores question of teacher. This category is checked whenever the pupil, either deliberately or inadvertently, ignores, or does not answer or comment on, a question of the teacher provided that the teacher expects an answer to the question (see A1) and that the question is asked in such a way that it is, in all probability, audible to the pupil. This category is checked regardless of the occasion during which the question is asked, for example, during a test or a play period.

5. Pupil shows hostility toward teacher. This behavior may be either verbal or non-verbal, but it must be such as to clearly indicate, not merely imply, hostility. The hostility may be in the form of a direct refusal, a definite resistance, or a distinct reluctance on the part of the pupil to perform some task or to take some particular course of action; it may be a specific comment of a derogatory or derisive nature made to the teacher or to another pupil about the teacher, or it may take the form of an expression or gesture made by the pupil to the teacher or behind the teacher's back, e.g., to stick out his tongue or to "make a face" at the teacher. This category would also be checked should the pupil hit, or strike at, or throw some object at the teacher.



6. Pupil shows affection for teacher. This behavior may be either verbal or non-verbal, but it must be such as to clearly indicate, not merely imply, affection for the teacher. The affection may be expressed in the form of a comment or remark to the teacher or to another pupil about the teacher, e.g., "You are my favorite teacher," "You are nice," "I like Miss X," or it may be a direct expression of affection, i.e., putting his arm around the teacher or taking the teacher's hand.

Group E: Pupil-Class

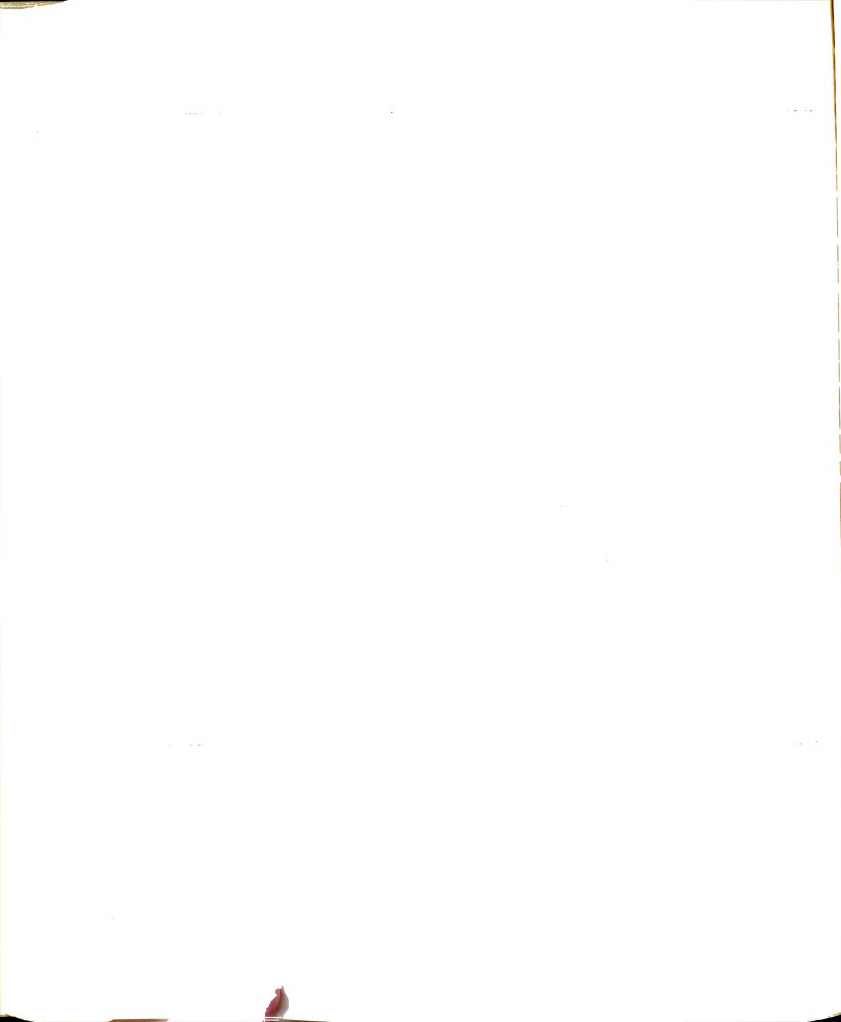
1. Pupil talks to class or group. This category is checked when a pupil talks extemporaneously, except for those times when the pupil simply gives brief answers to a question (see A1). This category is checked when, for example, a pupil tells what he saw on the way to school, what he liked best at the fair, or what he thought of a story.

2. Pupil recites. This category is checked when the pupil presents material learned by rote, usually in the form of a memorized poem or story or a particular fact or set of facts such as, for example, "What states border Michigan," "Name the thirteen colonies," "Who invented the cotton gin."

3. Pupil reports, gives prepared talk. This category is checked when the pupil gives an organized prepared report or talk whether from memory (not to be confused with E1), read from a paper, or given with the aid of note or reference cards.

4. Pupil reads aloud. This category is checked when the pupil, usually at the request of the teacher, reads aloud from the text, a workbook, or similar material.

5. Pupil demonstrates, illustrates. This category is checked whenever the pupil uses the blackboard, a three-dimensional model, a map, chart, graph, picture, poster, or other pictorial material as a means of facilitating explanation, elaboration, clarification, or the



imparting of information. Note that this category is different and distinct from F4: Pupil works at board.

6. Pupil gives skit or play. This category is checked when the pupil takes an active part in the presentation of a skit or a play.

7. Pupil sings, plays instrument. This category is checked whenever a pupil sings or plays an instrument whether this is done alone or in a group.

8. Pupil plays game. This category is checked whenever two or more pupils play a "recreational" or an "educational" game. If only one person is involved, such as working a puzzle, F2 is checked.

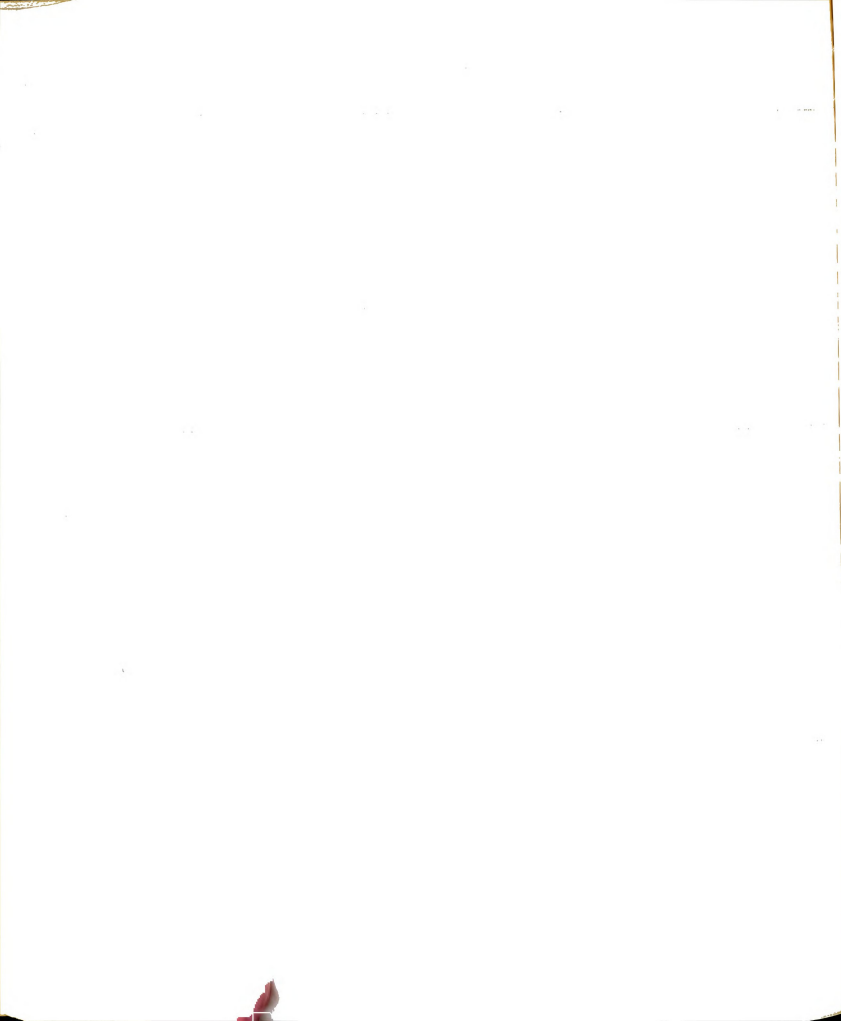
9. Pupil leads class. This category is checked whenever a pupil assumes the responsibility for a class presentation or a class function of an academic nature, i.e., excluding singing, exercise, games (see E10). In this category, the pupil ordinarily operates as a class chairman, class president, panel moderator or member, or in a similar capacity. This category is different and distinct from E1, E2, E3, and E4 for in these categories the teacher remains the active class leader despite the pupil contribution.

10. Pupil leads singing, exercise, games. This category is checked whenever a pupil leads the class in singing, exercises, or games.

11. Pupil passes book(s), paper, milk. This category is checked whenever a pupil, or pupils, with or without the consent or the aid of the teacher, performs the specified or similar activities.

Group F: Pupil Activities

1. Pupil reads, studies at seat. This category is checked whenever the pupil reads or studies at his desk, or at a location which is being temporarily used as a desk. If the pupil is both reading and writing, F2 is checked.



2. Pupil writes, manipulates at seat. This category is checked whenever a pupil does any writing or calculating or manipulating of some object, for example, an abacus, clock model, or flash card at his desk, or at a location which is being temporarily used as a desk. This is, however, not checked when the pupil is doing art or craft work (see F3).

3. Pupil paints, draws, cuts, pastes at seat. This category is checked whenever a pupil is engaged in some type or kind of art or craft work, either at his desk or at some location used by the pupil as a temporary desk.

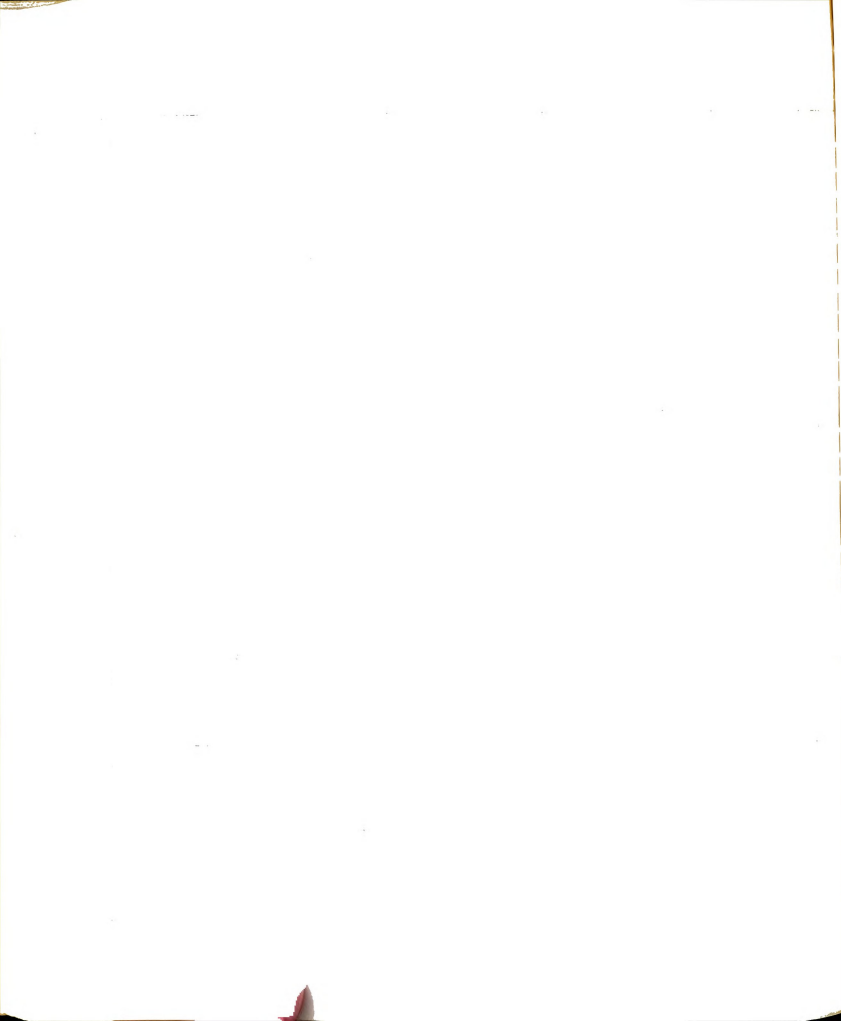
4. Pupil works at board. This category is checked whenever a pupil uses the blackboard, either at his own discretion or at the direction of the teacher, except when the pupil uses the blackboard as a means of facilitating explanation (see E5) or when the pupil decorates the board (see F5).

5. Pupil decorates room, board. This category is checked whenever a pupil, with or without the direction or permission of the teacher, decorates a bulletin board, blackboard, window, or wall.

6. Pupil cleans room, board. This category is checked whenever a pupil, with or without the direction or request of the teacher, erases or washes the blackboard, picks up paper from the floor, or performs similar tasks.

7. Pupil rests, has snack. This category is checked whenever a pupil, with or without permission of the teacher, rests on a mat, or at his seat, or has a snack.

8. Pupil leaves room. This category is checked whenever a pupil, with or without permission of the teacher, leaves the classroom.



Group G: Pupil-Pupil

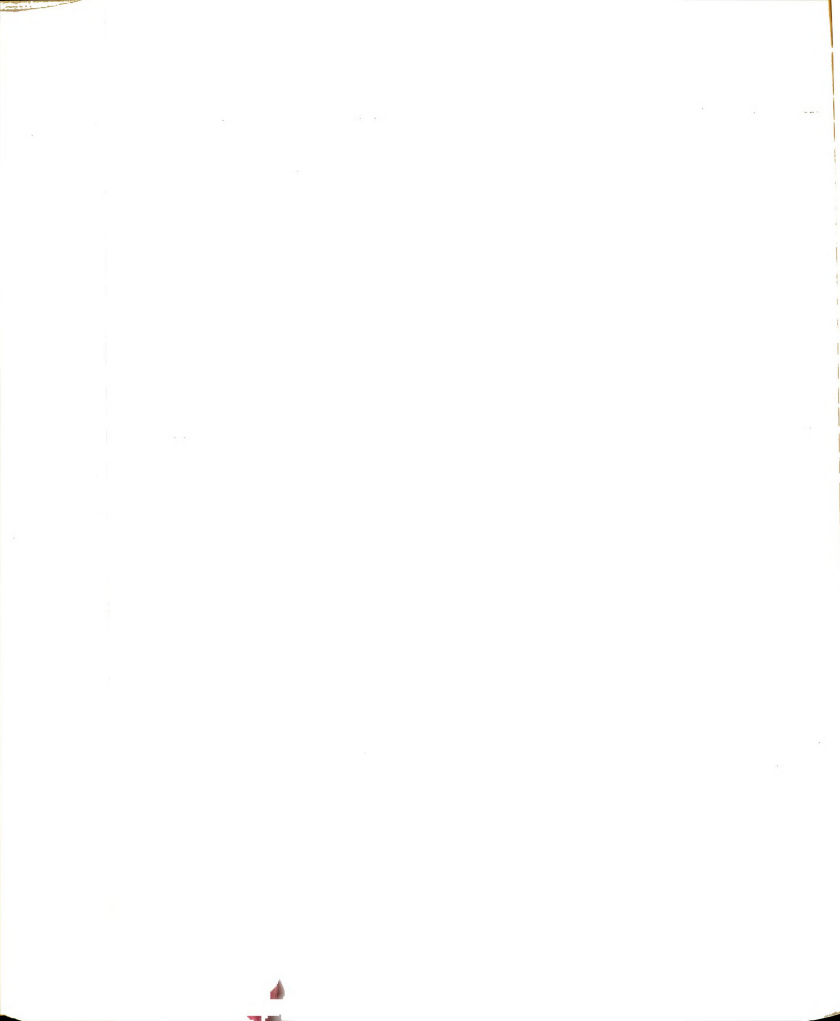
1. Pupil scuffles, fights with pupil. This category is checked whenever two or more pupils engage in hitting, slapping, wrestling, or some other form of scuffling or fighting. This category is thus checked only when force or contact is present.

2. Pupil shows hostility toward pupil. This category is checked whenever a pupil throws some object, for example, paper, eraser, pencil, or paper clip at another pupil; when a pupil directly threatens or warns another pupil, i.e., "If X (behavior) continues or occurs then Y will happen (as a result of his action)," or when the threat or warning is explicit in the action of the pupil, e.g., shaking a fist at a pupil; or whenever a pupil uses words which, in their context, indicate anger, bitterness, scorn, ridicule, sarcasm, rebuff, or derision of, or for, toward, or about, another pupil. Thus, the hostility may be either verbal, or nonverbal, or both. It may be direct or indirect, i.e., it may be to or about the pupil concerned. However, it must be clearly indicated hostility by the action, the expression, the context, or by all three.

3. Pupil shows affection toward pupil. This category is checked when a pupil talks or laughs with another pupil, when he takes another pupil's hand, puts his arm around another pupil, smiles at another pupil, or makes some remark such as, "I like you," or "I like X" to or about another pupil. Thus, the expression of affection may be either verbal or nonverbal or both. However, it must be a clear expression of affection by the action, the expression, the context, or by all three.

Group H: Grouping

1. Teacher choice of volunteers. This category is checked when the teacher makes the choice of persons to be part of a particular group, or to perform some activity or task entirely from among those pupils who volunteered (by raising their hand or some other method) for the task, or activity, or group.



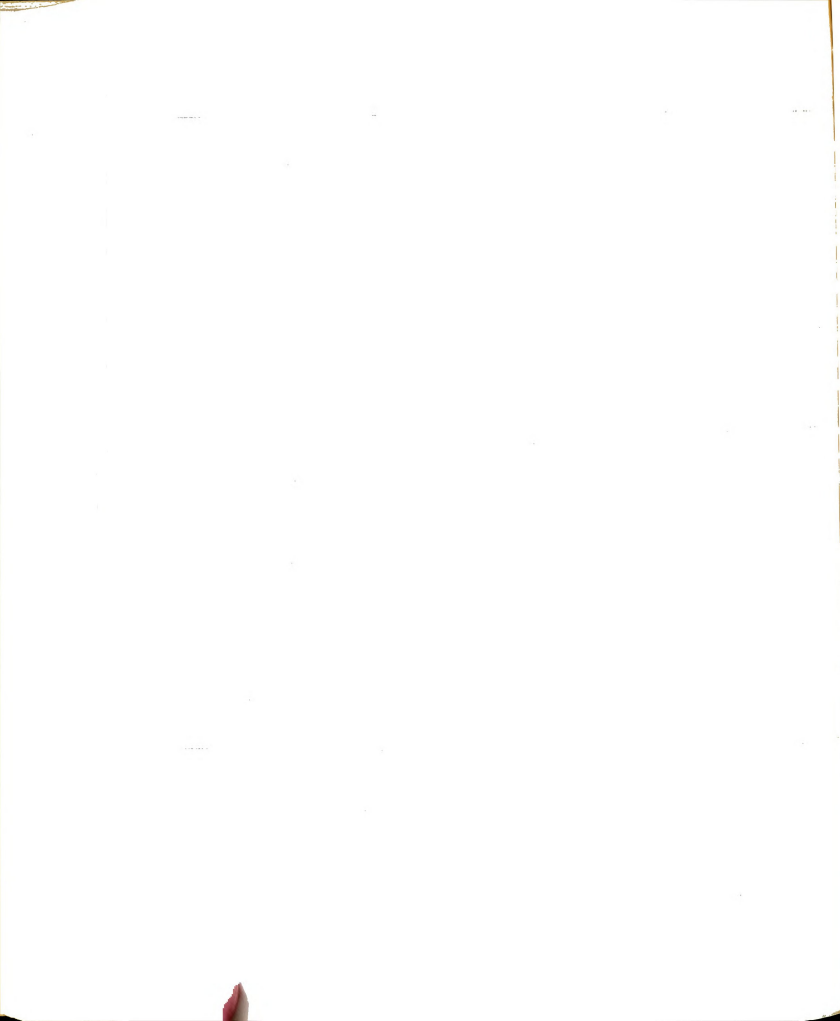
Note: If the selection is based in part on volunteers and in part on some other basis, H2 should be checked.

2. Teacher choice on some arbitrary basis. This category is checked when the teacher makes the choice of persons to be part of a particular group, or to perform some activity or task, partially or entirely on some basis other than pupils who volunteered, e.g., "All those that missed problem three come to the front of the room." If it is not certain whether the pupils volunteered for the particular group, or activity, or task, for example, "Now that we have finished the spelling lesson you may re-form your social studies committees and continue to work on your special group problems," this category is to be checked.

3. Pupil choice of volunteers. This category is checked when a pupil, as a class or group leader, is responsible for and makes the selection of other pupils for a particular group, or activity, or task, entirely from among those pupils who volunteered (by raising their hands or by some other method) for the group, or activity, or task.

4. Pupil choice on some arbitrary basis. This category is checked when a pupil, as a class or group leader, is responsible for and makes the selection of other pupils for a particular group, or activity, or task, in whole, or in part, on some basis other than volunteers.

5. Pupil goes to the group of his choice. This category is checked whenever the pupils are free to go to any group of their own choosing, for example, "All of you who wish to help with a report on George Washington go to the table in the back of the room, those of you who wish to help with a report on Abraham Lincoln can use my desk, and those of you who wish to help make a report on Woodrow Wilson can use the table at the side of the room."



Group I:

Individual task with teacher. A task is an individual task when a pupil is engaged in some activity or project in which the pupil alone is responsible for determining and/or accomplishing a goal and/or the means for attaining that goal. "With teacher" means that the teacher is not merely present in the room but that he is engaged in aiding an individual pupil or pupils. I1, I2, or I3 is checked depending upon the size of the group, i.e., over one half the class, four pupils to half the class, or two or three pupils.

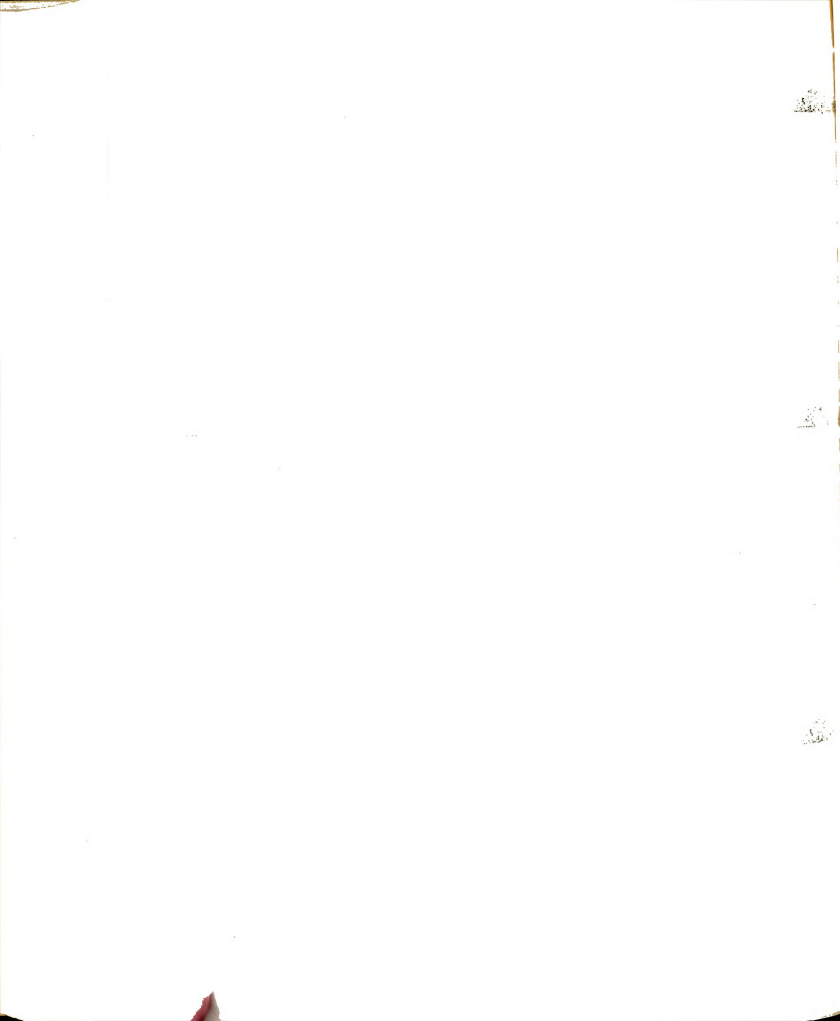
Group J:

Group task with teacher. A task is a group task when two or more pupils are engaged in some activity or project in which the pupils together--through discussion and planning--are responsible for determining and/or accomplishing the goal and/or the means for attaining that goal. It should be noted that a category in this group is not checked when two or more pupils are performing the same task individually. The remainder of the distinctions made in this group are the same as in Group I.

Groups K and L:

Individual task without teacher. "Without teacher" means that the teacher is not engaged in aiding an individual pupil or pupils. It should be noted that some category in Groups K or L (Groups "without teacher") would be checked when, for example, the teacher is in the classroom but is grading papers or doing some other "desk" work.

The remainder of the distinctions which are necessary to make regarding the categories of Groups K and L have been discussed in connection with Groups I and J.



Groups M and N:

These groups pertain to the materials used by the teacher and the pupils respectively in carrying out their activities. The materials included are:

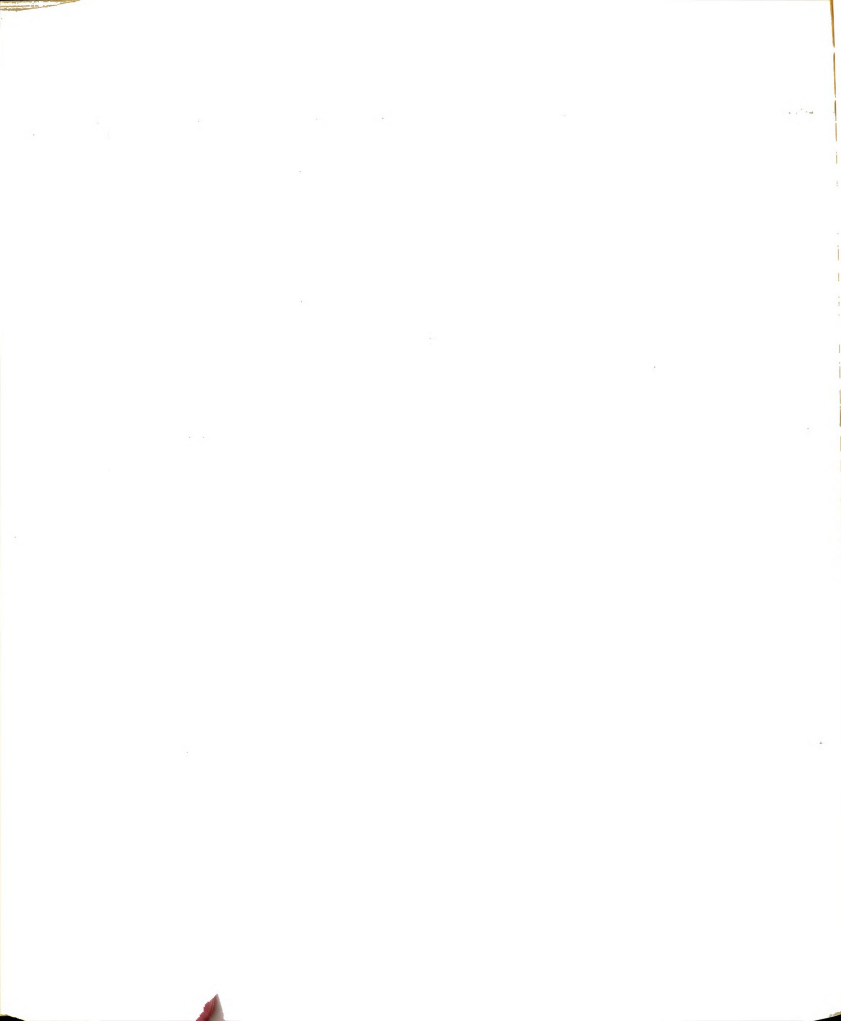
1. blackboard
2. map, chart, or picture
3. slide, film strip, or film
4. audio aid (such as tape recorder, microphone, or record)
5. three dimensional object (such as model)
6. textbook or workbook
7. supplementary reading materials
8. writing materials
9. handicraft or art materials
10. special teaching or learning materials not itemized
11. no material used

If special teaching or learning materials which are not itemized are used by the teacher and/or the pupils, the observer should specify at the bottom of the appropriate group the particular material or materials being used.

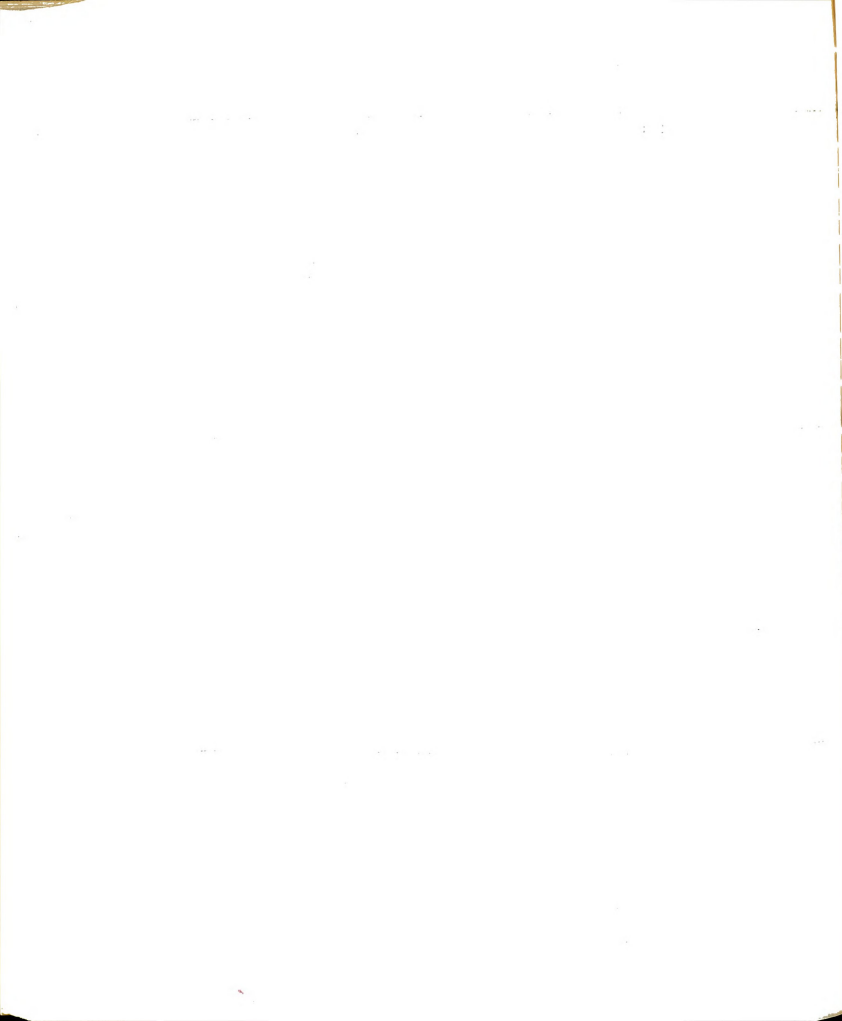
Group O:

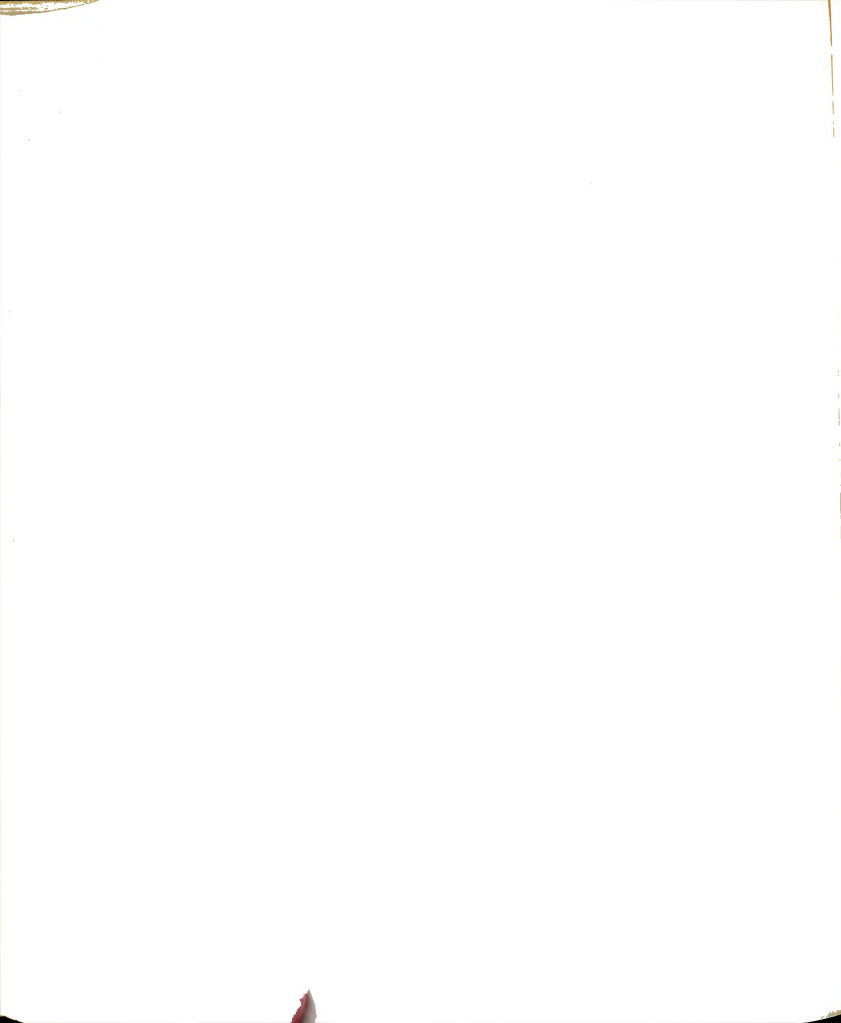
This group pertains to the content area or areas which are discussed by the teacher and the pupils during the observation period. The content area on which the teacher spends the majority of his time during the observation period should be checked twice. If "test" is checked, some other category or categories pertaining to the subject area or areas the pupils are being tested on should also be checked.

NOTE: The definitions of categories for OSCAR III were taken from the USOE research project conducted by Roger E. Wilk, William H. Edson, Don Davies, and Naomi C. Chase, A Study of the Relationship Between Observed Classroom Behaviors of Elementary



Student Teachers, Predictors of Those Behaviors,
and Ratings by Supervisors (University of Minne-
sota, 1962), Appendix A-3. Minor revisions in
the text were made.





APPENDIX D
MEANS AND STANDARD DEIVATIONS FOR VARIABLES ON
THE OBSERVATION SCHEDULE AND RECORD AND
PERSONALITY VARIABLES

Table A.1.--Means and Standard Deviations of OScAR Categories: Pupil Activities^a

Category	Mean	S.D.
Pupil-Teacher		
Pupil whispers	5.43	4.66
Pupil laughs	1.64	2.35
Pupil interrupts teacher	4.66	3.45
Pupil ignores question of teacher	0.72	1.27
Pupil shows hostility to teacher	0.99	1.70
Pupil shows affection to teacher	0.84	2.00
Pupil-Class		
Pupil talks to group	3.31	3.13
Pupil recites	3.97	3.64
Pupil reports, gives prepared talk	0.37	0.87
Pupil reads aloud	3.66	2.78
Pupil demonstrates, illustrates	1.36	1.72
Pupil gives skit, play	0.23	0.68
Pupil sings, plays instrument	0.32	0.88
Pupil plays game	0.81	1.44
Pupil leads class	0.73	1.27
Pupil leads singing, exercises, game	0.25	0.68
Pupil passes books, paper, milk	1.41	1.46
Individual Pupil		
Pupil reads, studies at seat	5.66	4.03
Pupil writes, manipulates at seat	8.56	4.35
Pupil paints, cuts, draws	2.38	2.45
Pupil works at board	1.00	1.56
Pupil decorates room, board	0.27	0.71
Pupil cleans room, board	0.66	1.24
Pupil rests, has snack	0.58	1.12
Pupil leaves, enters room	3.77	2.81
Pupil-pupil		
Pupil scuffles, fights with pupil	0.33	0.78
Pupil shows hostility to pupil	1.59	1.88
Pupil shows affection to pupil	1.16	2.02

^aBased on eighteen observations of 180 teachers.

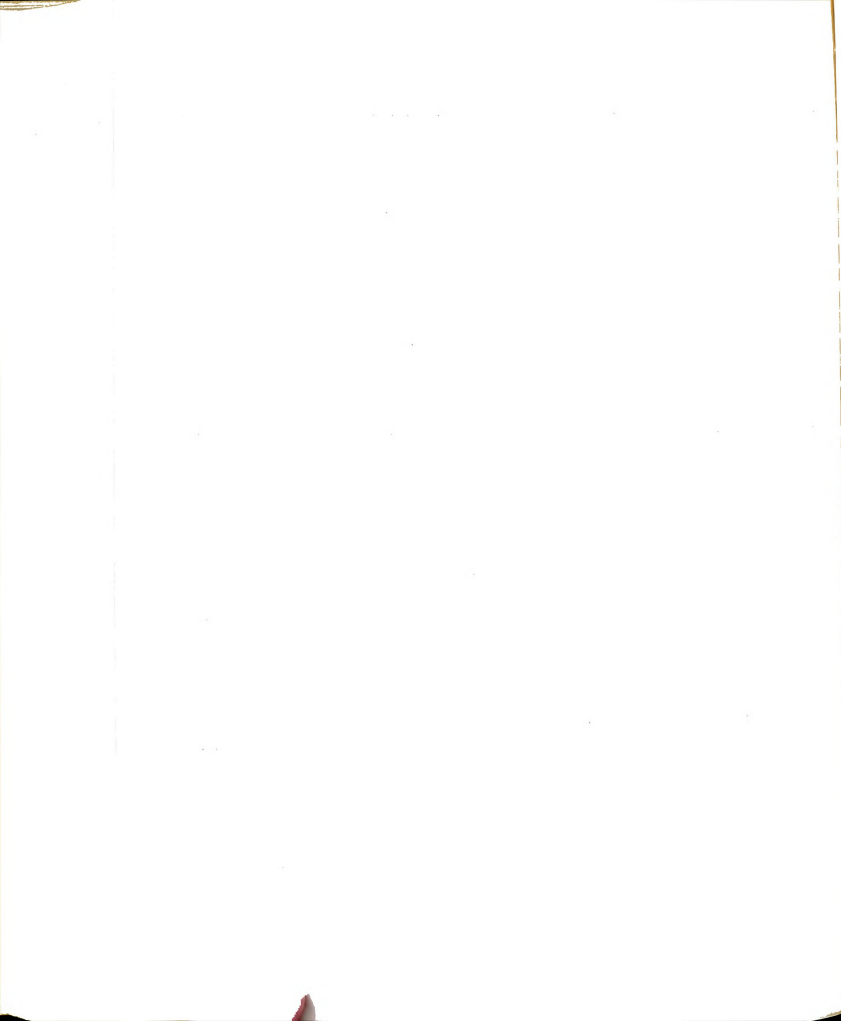


Table A.2.--Means and Standard Deviations of OScAR Categories: Teacher Activities^a

Category	Mean	S.D.
Teacher-Pupil		
Teacher questions, pupil answers	11.34	3.51
Teacher answers pupil question	8.37	4.64
Teacher interrupts pupil	1.41	1.79
Teacher ignores pupil question	1.14	1.95
Teacher warns, threatens pupil	3.11	3.07
Teacher criticizes, uses sarcasm	3.31	3.44
Teacher praises good work	4.27	3.90
Teacher praises good behavior	1.44	2.04
Teacher works with individual pupil	6.27	3.72
Teacher-Class		
Teacher lectures	1.58	2.37
Teacher reads, tells story	1.16	1.41
Teacher talks to class	11.27	3.42
Teacher illustrates at board	3.25	2.55
Teacher illustrates with map, chart	0.61	0.95
Teacher demonstrates	1.60	1.84
Teacher shows film, slide	0.61	1.25
Teacher passes books, paper, milk	1.22	1.44
Teacher leads singing, exercises, game	0.68	1.34
Solitary		
Teacher works at desk	1.48	1.87
Teacher cleans, decorates room	0.18	0.54
Teacher writes on, decorates board	0.67	1.17
Teacher leaves, enters room	0.79	1.20
Teacher talks with visitor	1.43	1.74

^aBased on eighteen observations of 178 teachers.

Table A.3.--Means and Standard Deviations of OSaAR Categories: Grouping Activities^a

Category	Mean	S.D.
Selection of Members		
Teacher's choice of volunteers	0.83	1.59
Teacher's choice on some arbitrary basis	5.01	4.24
Pupil's choice of volunteers	0.17	0.50
Pupil's choice on some arbitrary basis	0.37	0.86
Pupil goes to group of his choice	0.42	1.18
Individual task with teacher		
Over 1/2 the class with teacher	3.19	3.81
Four to 1/2 the class with teacher	0.83	1.80
Two to three with teacher	0.77	1.43
Group task with teacher		
Over 1/2 the class with teacher	7.32	4.18
Four to 1/2 the class with teacher	3.15	3.13
Two to three with teacher	0.55	0.96
Individual task without teacher		
Over 1/2 the class without teacher	4.76	3.65
Four to 1/2 the class without teacher	0.94	1.58
Two to three without teacher	0.62	1.20
Group task without teacher		
Over 1/2 the class without teacher	1.39	2.42
Four to 1/2 the class without teacher	0.54	1.06
Two to three without teacher	0.58	1.34

^aBased on eighteen observations for each of 163 teachers.

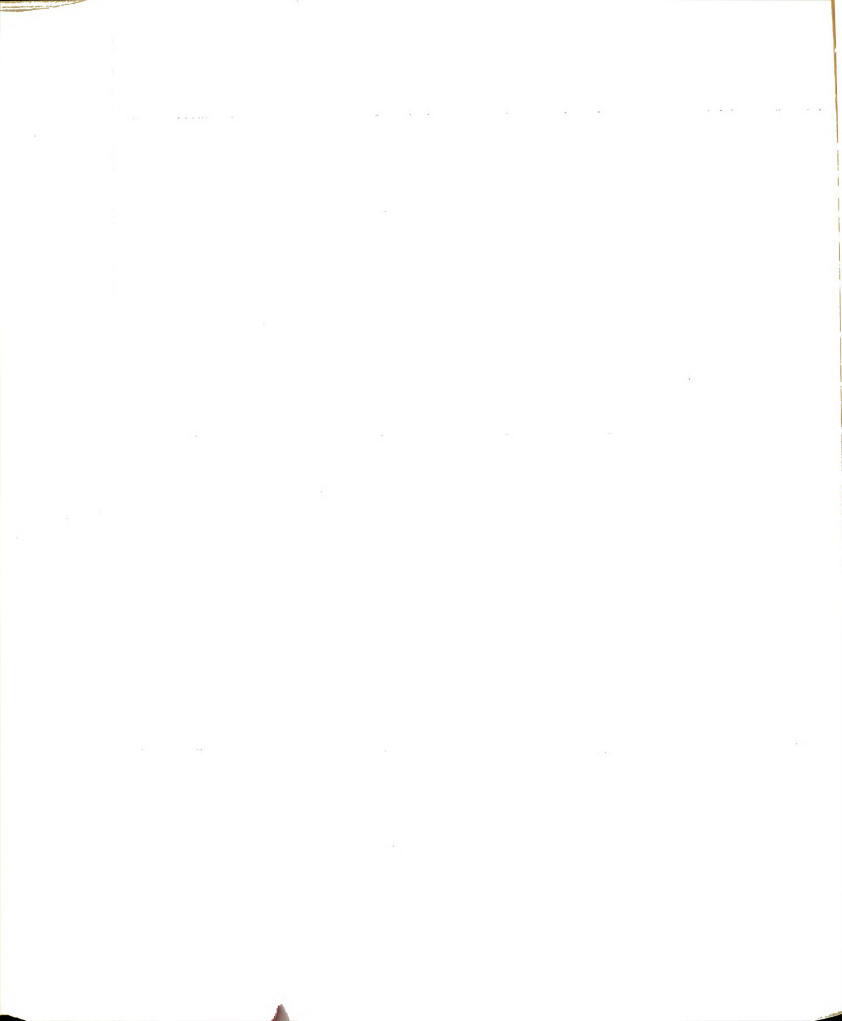


Table A.4.--Means and Standard Deviations of OSCAR Variables: Materials Used by the Teacher and Pupils^a

	Teacher		Pupils	
	Mean	S.D.	Mean	S.D.
Blackboard	4.55	3.00	1.94	2.63
Map, chart, picture	1.04	1.57	1.18	1.89
Slide, film, etc.	0.76	1.39	0.28	0.93
Audio aid	0.44	1.05	0.38	1.28
Three dimensional object	0.89	1.64	1.51	2.15
Text, workbook	6.95	4.01	8.48	4.30
Supplementary reading material	1.44	1.79	3.31	3.06
Writing	1.33	2.34	7.14	4.77
Handicraft, art	0.65	1.38	2.13	2.40
Special teaching aid	1.88	2.34		
Special learning aid			2.64	2.98
No materials used	2.97	2.69	1.86	2.13

^aBased on eighteen observations in each of 178 classrooms.

Table A.5.--Means and Standard Deviations of OSCAR Variables: Subject Matter Observed^a

Subject Matter	Mean	S.D.
Reading	4.65	3.66
Mathematics	3.76	2.89
Language Arts	4.91	3.33
Social Studies	2.22	2.76
Science	1.72	2.59
Health, recreation	0.87	1.67
Arts and crafts	1.17	1.96
Music	0.33	0.86
Test	0.59	1.10
Other	0.57	1.65

^aBased on eighteen observations for each of 178 teachers.

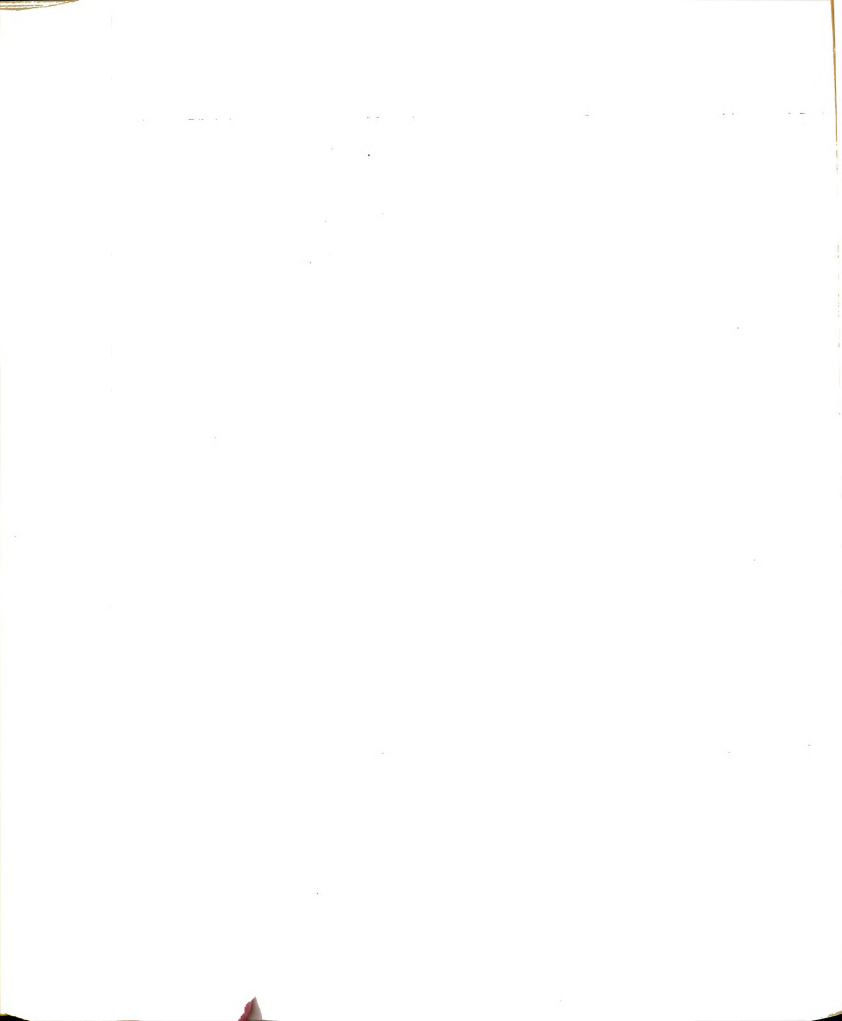
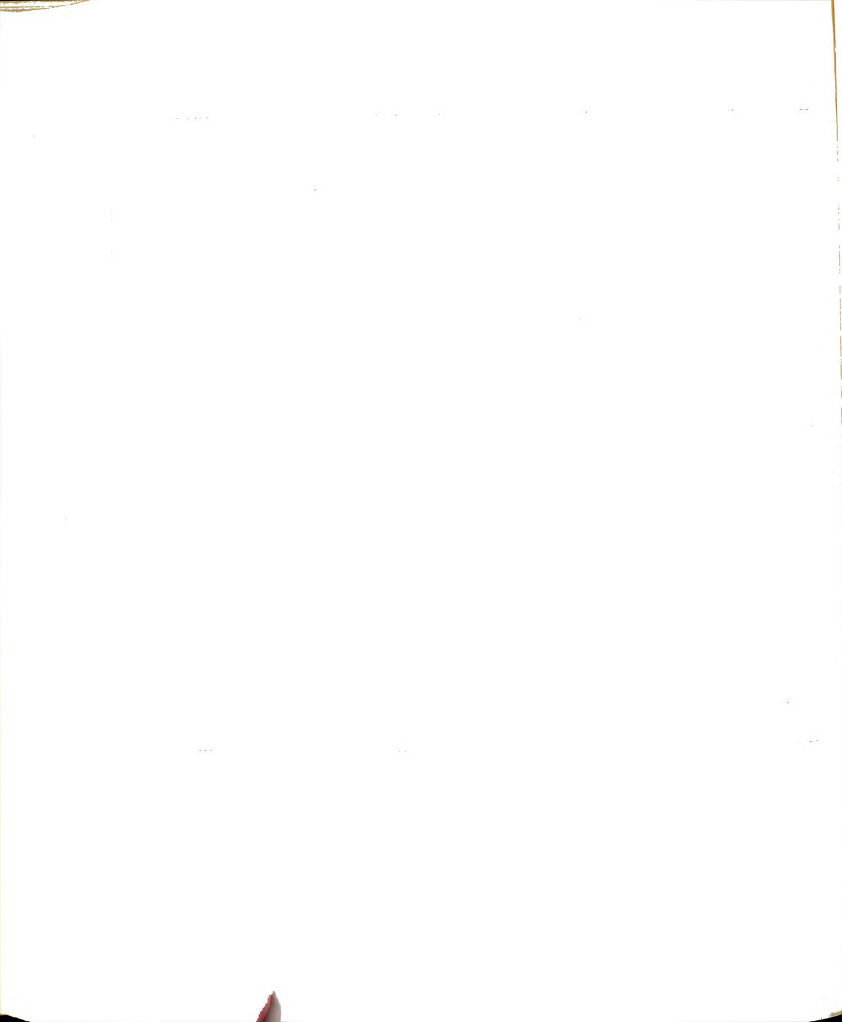


Table A.6.--Means and Standard Deviations; Personality Variables.

Variable	Mean	Standard Deviation
Achievement	12.65	3.89
Deference	12.42	3.81
Order	10.74	4.32
Exhibition	13.85	3.54
Autonomy	12.29	4.49
Affiliation	16.47	4.27
Intraception	17.98	4.89
Succorance	12.35	4.69
Dominance	13.36	4.52
Abasement	15.71	4.77
Nurturance	16.44	5.00
Change	17.24	4.71
Endurance	13.17	5.08
Heterosexuality	13.16	5.81
Aggression	11.11	4.46
Consistency	11.31	1.96
MTAI	39.88	25.28
Dogmatism	63.21	11.92



APPENDIX E

FACTOR LOADINGS FOR ONE HUNDRED CLASSROOM

OBSERVATION VARIABLES ON EACH OF FIVE

FACTORS IN THE FOURTH ROTATED SOLUTION

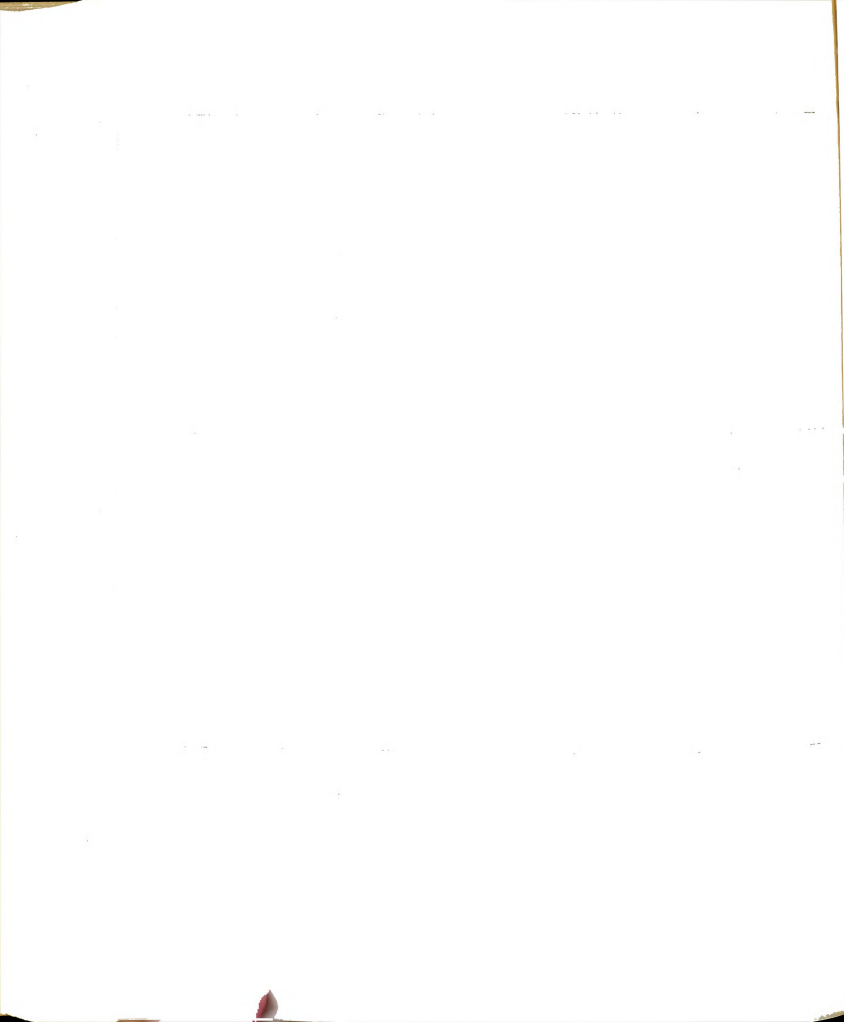


Table A.7.--Factor Loadings for One Hundred Classroom Observation Variables on Each of Five Factors in the Fourth Rotated Solution.

Variable Number	Factor Loading					h^2
	I	II	III	IV	V	
1	346*	607*	137	189	147	564
2	136	089	540*	453*	063	527
3	054	100	001	-069	442*	213
4	-012	111	184	-025	489*	286
5	-236	-054	-174	-193	399*	285
6	-216	025	112	-078	485*	302
7	506*	231	148	175	-120	376
8	479*	-011	-084	015	-055	239
9	325*	-173	561*	072	-034	456
10	-184	009	025	005	249	097
11	131	198	011	-078	114	076
12	393*	227	236	062	-040	267
13	-032	634*	-044	-093	033	414
14	407*	226	-015	101	-053	230
15	694*	-051	-018	135	-186	538
16	-037	-055	-215	431*	083	244
17	237	018	-047	-059	106	074
18	437*	-033	-222	029	-238	299
19	-197	-108	258*	103	209	172
20	105	-207	056	077	060	067
21	-028	-024	-121	-160	077	048
22	-108	-246	166	056	404*	266
23	190	-256	131	-029	206	162
24	-121	-165	-091	-460*	376*	404
25	-035	-151	-197	-358*	255	256

*Significant at the .01 level.

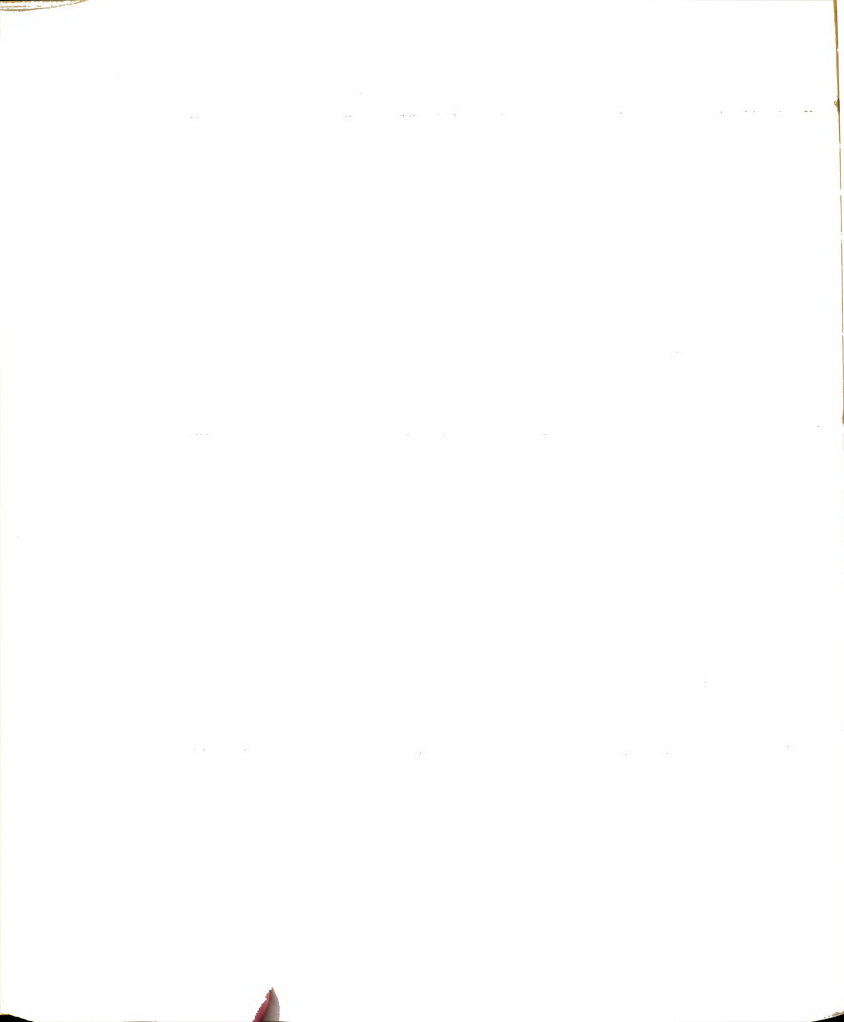


Table A.7.--Cont.

Variable Number	Factor Loading					h^2
	I	II	III	IV	V	
26	114	145	-065	-118	667*	498
27	-120	-132	-115	-065	487*	287
28	-238	-041	105	-032	557*	380
29	576*	-154	044	163	056	388
30	172	-052	105	242	-100	112
31	202	348*	023	101	-228	225
32	-168	-168	070	255	-050	129
33	-092	621*	115	-160	157	457
34	357*	111	055	466*	-203	401
35	065	-219	-040	-165	-282*	161
36	323*	-341*	-075	-044	-276*	304
37	450*	082	-051	-025	-166	240
38	138	-192	072	208	-312*	202
39	213	-195	-170	-020	-271*	186
40	241	095	-023	101	-045	080
41	-148	121	613*	-038	087	421
42	-199	234	591*	-033	154	469
43	459*	-072	363*	-303*	-142	460
44	136	381*	062	-033	-114	181
45	169	-235	131	062	-131	122
46	283*	-252	201	-044	122	201
47	267*	-045	-018	-007	303*	165
48	203	-074	232	-007	240	159
49	088	-291*	-023	-133	448*	311
50	173	-109	083	-116	577*	395
51	553*	-244	-007	135	-008	383
52	057	-129	-217	-334*	-115	192
53	-040	024	101	-314*	075	116
54	290*	045	052	017	063	093
55	075	-122	073	-162	-319*	154

*Significant at the .01 level.

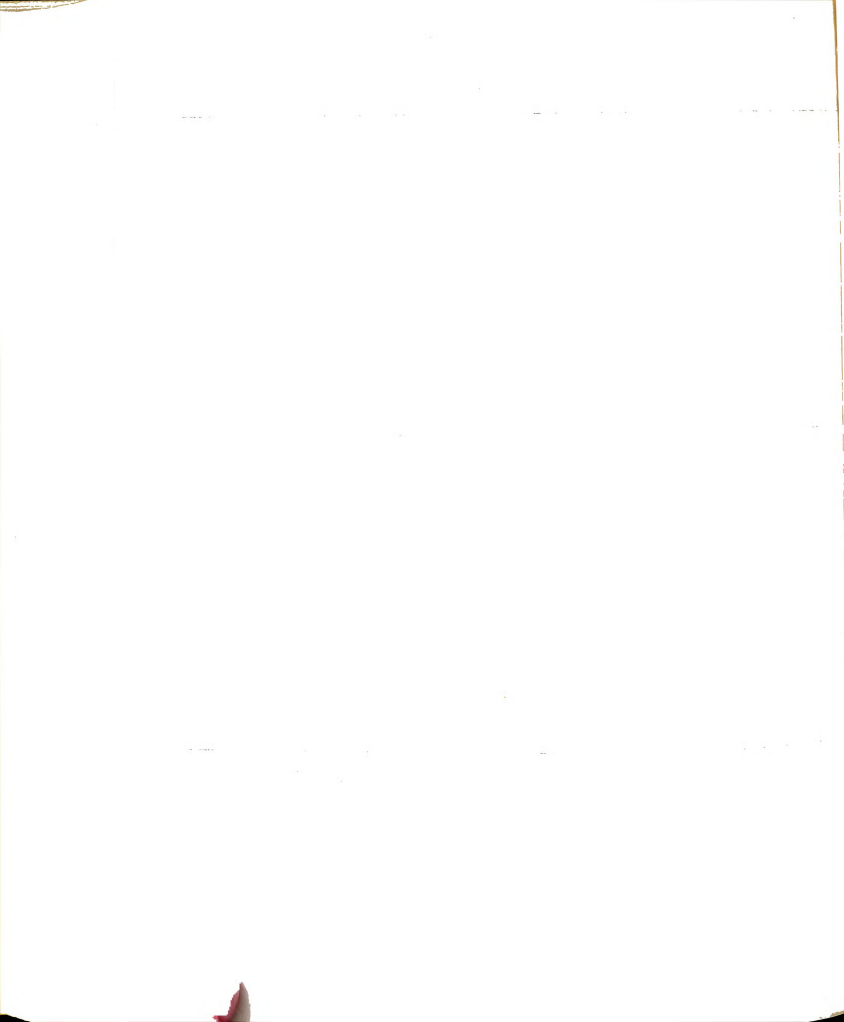


Table A.7.--Cont.

Variable Number	Factor Loading					h^2
	I	II	III	IV	V	
56	188	-224	063	198	-104	139
57	-047	-094	247	049	062	078
58	-003	153	034	-246	050	087
59	252	-169	052	-080	-092	109
60	099	089	-568*	062	017	344
61	-018	341*	223	-387*	-000	316
62	023	-020	051	081	-102	020
63	101	-008	467*	-227	012	280
64	064	-031	336*	-174	-095	157
65	-005	070	024	-263	124	090
66	-049	-021	-025	-321*	-309*	202
67	120	-123	217	-039	054	081
68	-122	-084	094	-053	111	046
69	-032	613*	-134	-186	051	433
70	524*	147	008	108	-130	325
71	-062	-077	-224	460*	135	290
72	208	-036	-035	050	-038	050
73	579*	080	-053	154	038	370
74	-448*	611*	025	-120	109	600
75	271*	103	160	-071	196	153
76	257	300*	226	-086	-047	216
77	488*	-166	-043	-186	068	307
78	174	-038	-029	374*	-069	177
79	-091	-612*	178	-079	-147	442
80	147	490*	-008	-185	-086	303
81	199	-041	365*	136	-210	237
82	-042	-061	-082	347*	189	168
83	062	-126	235	-024	-182	109
84	536*	-145	-013	122	-139	343
85	-506*	412*	332*	-125	087	559

*Significant at the .01 level.

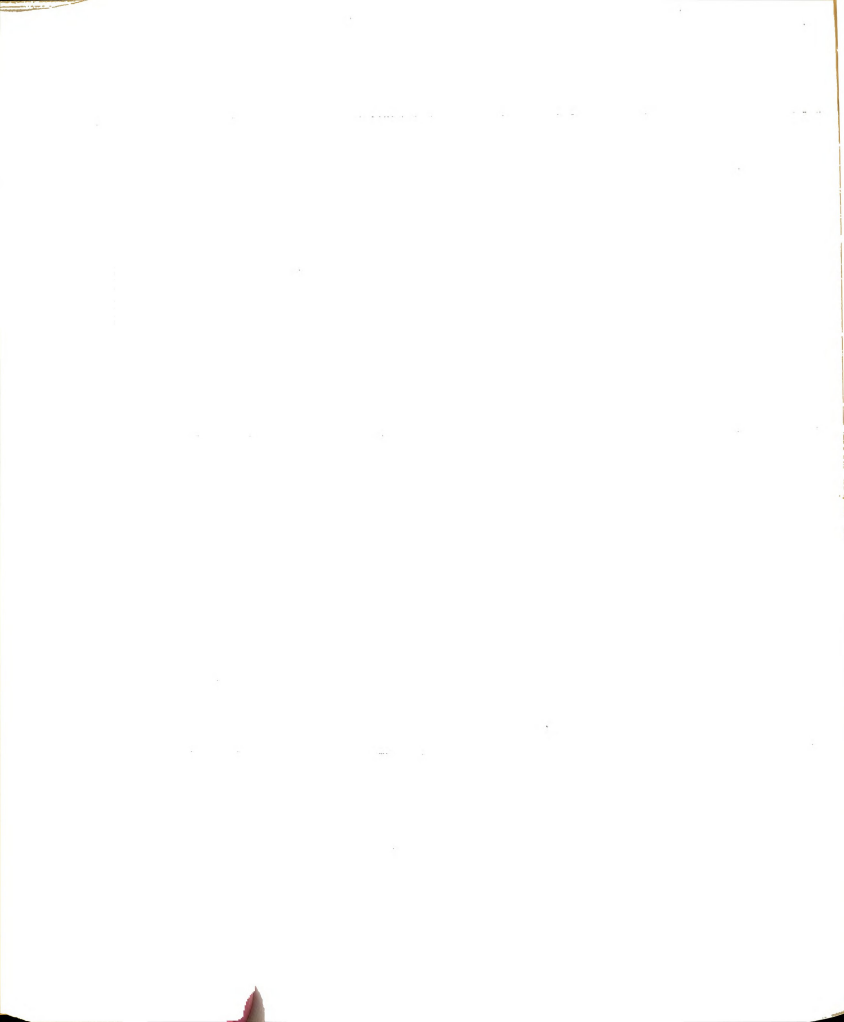


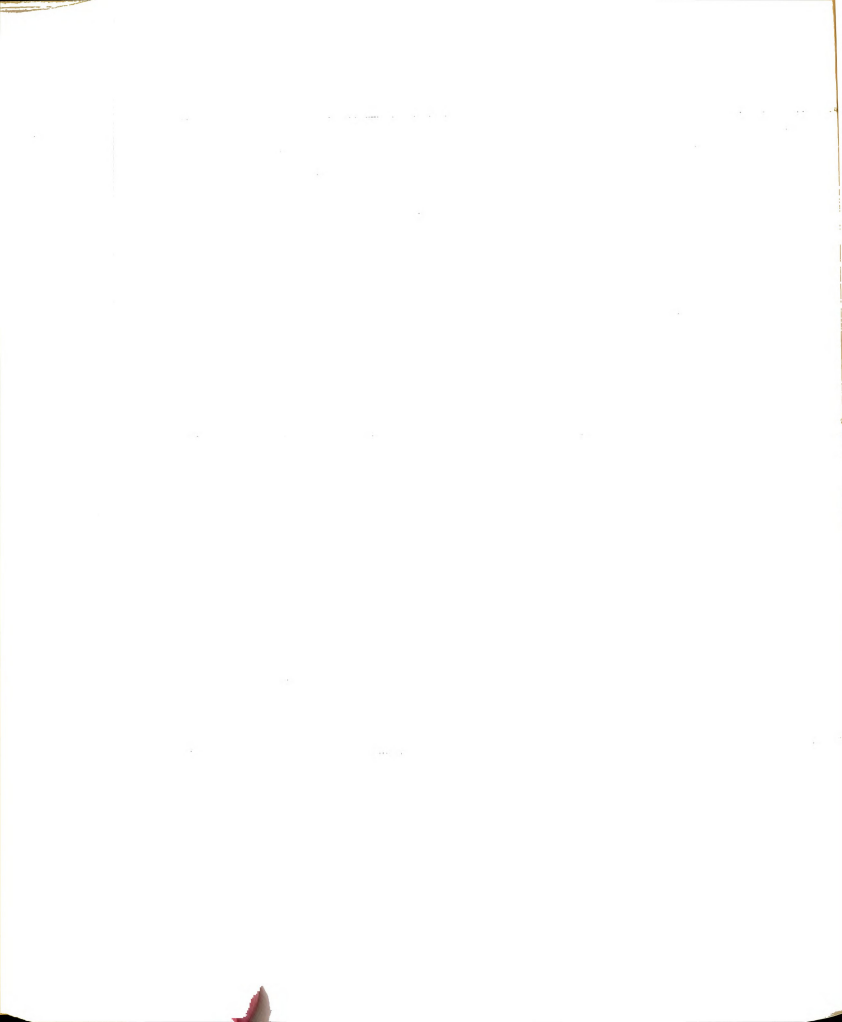
Table A.7.--Cont.

Variable Number	Factor Loading					h^2
	I	II	III	IV	V	
86	-036	-068	641*	-120	029	432
87	-064	273*	584*	-093	006	429
88	445*	-185	266*	-340*	-170	447
89	192	-131	187	489*	-099	338
90	157	-286*	-317*	-071	112	225
91	-043	319*	266*	-497*	057	425
92	-139	284*	218	048	-133	168
93	105	-061	037	-132	034	035
94	-128	-151	243	201	-024	139
95	045	-073	-043	503*	-019	262
96	246	-238	-385*	-039*	-093	275
97	587*	-217	-005	-234	004	447
98	232	-189	-310*	030	-189	223
99	-263*	-091	132	155	020	119
100	-008	022	104	037	086	020

*Significant at the .01 level.

The Guilford-Lacy expression was applied to compute the standard error of factor loadings.¹ This is justifiable since the factor loading is a function of the standard error of the original correlation matrix.

¹J. P. Guilford and J. I. Lacy, Printed Classification Tests, Army Air Forces Aviation Psychological Program, Research Report 5 (Washington, D.C.: Government Printing Office, 1947), 919.



First, the Standard Error (S.E.) is determined by taking the reciprocal of the square root of the number of variables analyzed.

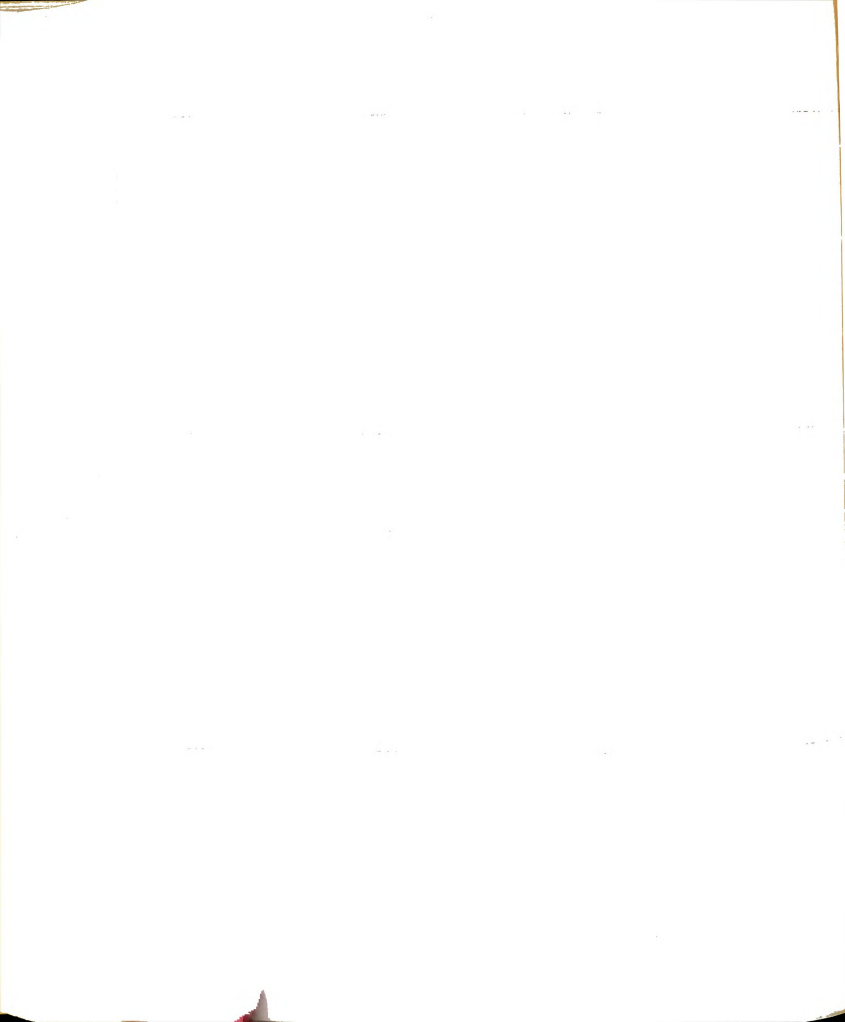
$$S.E. = \frac{1}{\sqrt{N}}$$

$$S.E. = \frac{1}{\sqrt{100}}$$

$$= .10$$

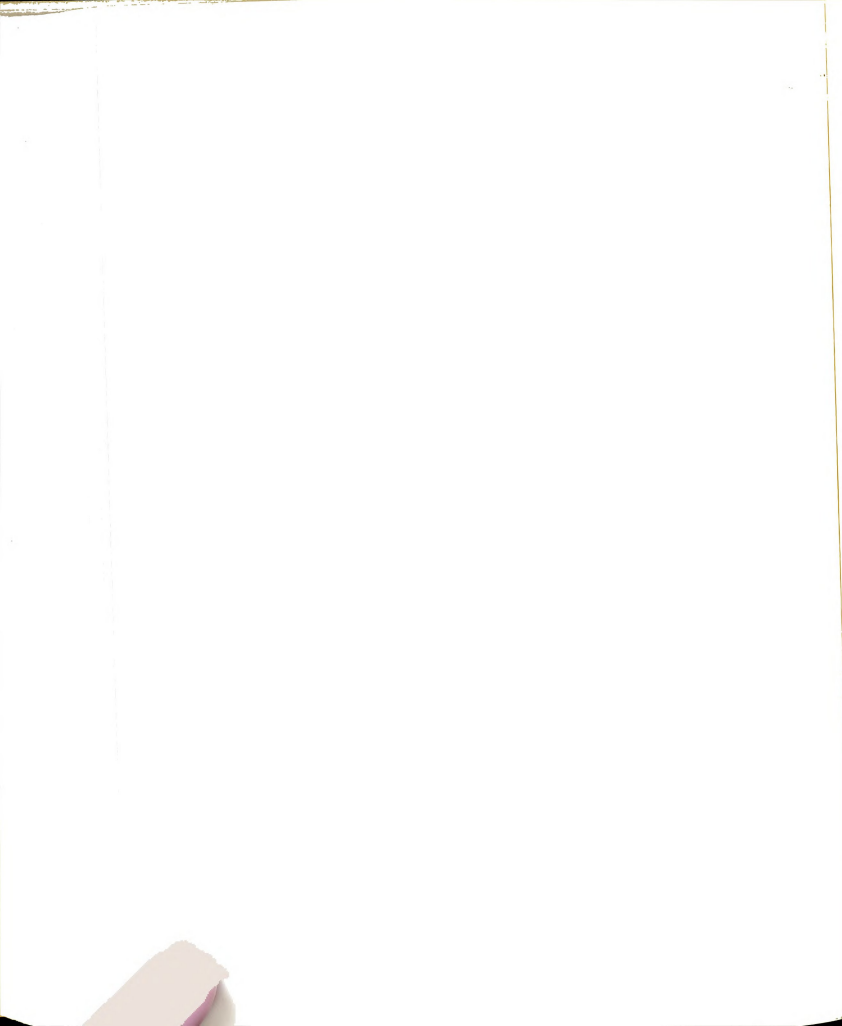
Using a fiducial level of .01, significant factor loadings equal or exceed $(.10) \times (2.58)$ or 0.258. Those factor loadings marked with an asterisk meet the above criterion.

Twenty-four of the one hundred variables were not significant on any factor. These variables might well be eliminated in further research. On the other hand, seventeen variables correlated significantly with more than one factor.

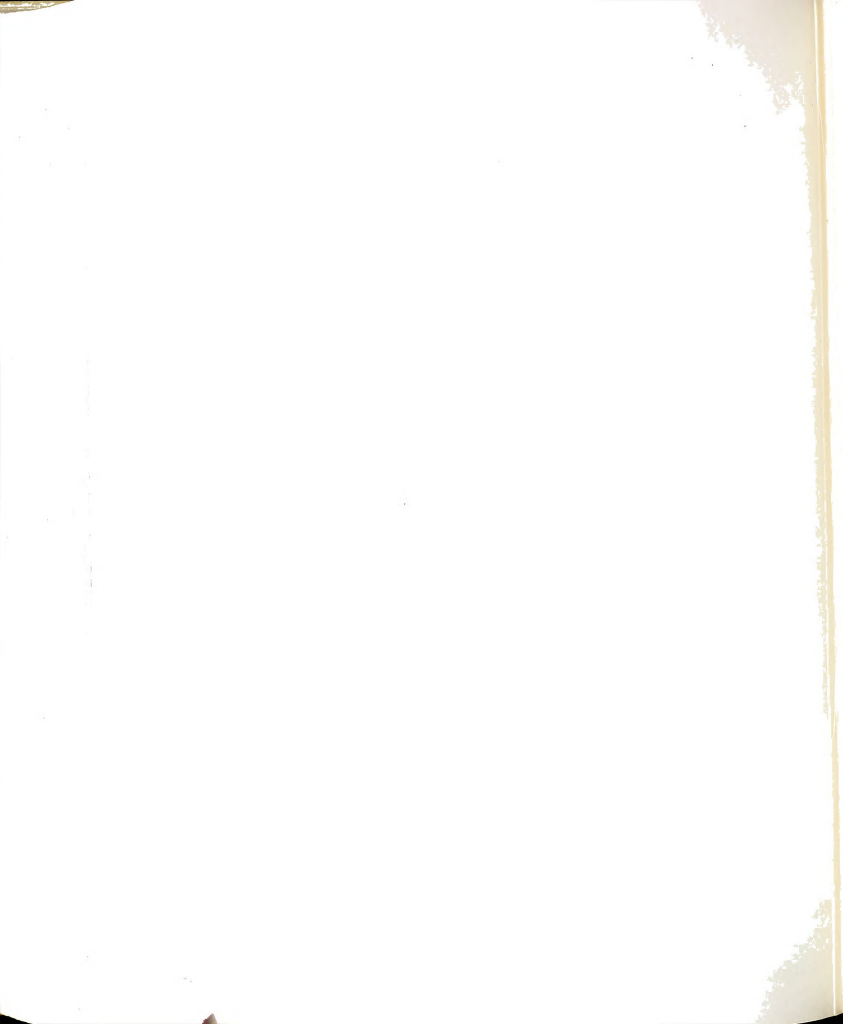












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