

1979

An ethnographic investigation of teacher behavior as a function of cognitive style

Kent L'Roy Koppelman
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An ethnographic investigation of teacher behavior
as a function of cognitive style

by

Kent L'Roy Koppelman

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of
The Requirements for the Degree of
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DEDICATION

In appreciation for the influence they have had on my development as a learner and as a human being, this dissertation is affectionately dedicated to:

my parents

Roy and Lois Koppelman

and

my wife

Janet

ABSTRACT

There has been much research on the field-dependent-independent dimension of cognitive style with regard to personality variables. This research has implications for education, but little research has been done concerning how cognitive style influences teacher behavior. The purpose of this study was to determine what differences existed in the teaching style of field-dependent and field-independent teachers.

An ethnographic approach relying upon participant-observation as the primary data gathering technique was used for this research. Five elementary teachers were observed for four months. Three of the teachers were field-independent, one male and two females, and two teachers were field-dependent, one male and one female. The teachers taught on the fourth, fifth, and sixth grade levels in the same school. All teachers had taught for 14 or more years. The teachers were determined to be strongly field-dependent or field-independent by the Group Embedded Figures Test.

Each of the five teachers was observed for two hours a week, once a week for the first seven weeks of the research, then four of the teachers were each observed for four consecutive days. The data in the field notes were categorized using two checklists developed by the researcher. One checklist concerned instructional procedures, and the other concerned the way the instructor interacted with students to maintain classroom control.

Seven hypotheses were supported by the findings: 1) Field-dependent teachers exhibited more warmth than field-independent teachers. They were friendly and familiar with students throughout the day. 2) Field-dependent teachers were more directive than field-independent teachers, giving commands, showing students how to do a task, and giving students answers. 3) Field-independent teachers were more analytical in their teaching style. They asked students questions and encouraged students to use reason. 4) Field-dependent teachers engaged in more positive physical contact with students than field-independent teachers. Touching students and allowing students to touch them characterized their interaction with students. 5) Field-independent teachers were more nurturant toward the student as a learner. Their supportive behavior was directed toward encouraging students in their cognitive development. 6) Field-dependent teachers were more critical than field-independent teachers. They used criticism of student behavior as a primary means of classroom control. 7) Field-independent teachers tended to use impersonal or positive techniques for classroom management. They exhorted students to use their time more productively or called for a sense of propriety.

INTRODUCTION

Research reports are written in the third person but they are written by a first person; they are done by persons. Research is inescapably a personal formation (Mooney, 1975, pp. 191-192).

It was near the end of my first full year of graduate work in education that I became quite interested in ethnography. I was fumbling for a research question and a methodology in which I could have confidence and interest. I wanted to learn as much as possible as I sought for the answer to my research question, and ethnography seemed to represent an attractive means whereby I could accomplish just that. A summer of intensive reading and fieldwork experience in a day care center convinced me that this methodology was appropriate for my needs.

The purpose of discussing the background of my search for a researchable question is to clarify both the nature of and the stimulus for this research.¹ Ross Mooney, in his essay, "The Researcher Himself," stressed the importance of the researcher being involved in the research question, rather than maintaining a pseudoscientific "distance." As the quote at the beginning of this chapter emphasizes, the researcher has done the research and he or she should explain what the research meant to him or her as well as what its significance is for the larger community of scholars.

¹This research was approved by the Iowa State University Human Subjects Committee December 18, 1978.

"Rather than scorn feelings and imaginings, the productive researcher gives these aspects of himself a full and challenging place" (Mooney, 1975, p. 194). This, it seems to me, is both the place and the time to clarify my concerns as I considered the problem of what sort of research I wanted to do.

I knew that an ethnographic approach to research meant that I would be investigating a new, relatively unexplored area. Ethnographic research must be exploratory in nature if it is to have value, because its focus is broad and its emphasis is descriptive. Ethnographic research in education usually attempted to find what the significant factors were rather than manipulate variables already proven to be pertinent. The excellent study by Harry Wolcott of the role of a principal and the precise description by John Cusick of schooling as perceived by high school students were examples of the quality of ethnographic insights. In reading their accounts, I was impressed not only with the conclusions they had reached, but with the process they had used to reach them. Their data was not packaged like some pop psychology, but represented the lengthy and often tedious pursuit of detail after detail in order to capture the rich mosaic that results from the patterns of human interaction.

There are many more names that should be mentioned. The work Jules Henry did in Watts and the study by Rosalie and Murray Wax of

Indian education at the Pine Ridge Reservation Schools has amply illustrated what Robert Stake had said, "What becomes useful understanding is a full and thorough knowledge of the particular" (1978, p. 6). This kind of research particularly made sense to me, because I believe that people are too complex to be studied simplistically, assuming that human variables can be isolated and making judgments solely on the basis of written responses to questionnaires. It made more sense to me to find out what people do by watching them, and what they think by asking them, and what they believe by comparing what they said and did. "A dialogue with persons in their natural setting will reveal the nuances of meaning from which their perspective and definitions are continually forged" (Schatzman and Strauss, 1973, p. 6).

Having determined a methodology appropriate to my needs, I was still left with the problem of finding a research question that was appropriate to the methodology. I wanted to watch teachers teaching in a classroom, but watch who, teaching what, and for what purpose? I knew from my reading that ethnographers often asked broad ambitious questions or often asked no questions at all but merely observed and recorded observations until questions began to emerge of their own account. As a graduate student making his first attempt at educational research, it did not seem appropriate for me to attempt to answer an ambiguous question. I wanted to define my problem so that I could concentrate my efforts and be confident of the results.

It was at this point that my major advisor suggested an article from a recent issue of the Review of Educational Research entitled "Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications" (Witkin, et al., 1977b). This article cited the recent extensive research concerning differences between people with identifiable field-dependent and field-independent cognitive styles. Essentially, field-dependent people appear to be more "other-oriented", they "look more at the faces of others . . . attend more to verbal messages with social content . . . prefer to be physically close to others" (pp. 10-11). The article further stated that although much research had been done to describe the characteristics of field-dependent and field-independent people with regard to personality, little research had been done in the classroom to discover if any differences existed in the behavior of field-dependent and field-independent teachers.

This question has importance for future research, and for the development of future teacher preparation programs. If a teacher has pedagogical preferences in the classroom which are based on his or her cognitive style, then that may be a limitation on the ability of the teacher to consider other options. Research on students had already indicated that field-dependent students perform better when given materials or a teaching style appropriate to their cognitive style needs. To be able to adapt to the needs of individual students, it may be important for teachers to know the cognitive

style of their students, their own cognitive style, and the preferences and needs that are associated with field-dependence-independence.

Mahlis (1978) had already suggested such implications in his review of field-dependence-independence research. Mahlis stated that teacher preparation programs may need to incorporate an awareness of the role of cognitive style in behavior for the purpose of developing the skills and knowledge of prospective teachers so they can adapt their teaching style to meet the cognitive style needs of their students. Mahlis went on to say that in-service programs may need to be developed to aid teachers in understanding their teaching behaviors as influenced by cognitive style and how to modify their behavior in certain situations or for certain students. Before all of this can happen, we need to know more about the precise role that cognitive style plays in teacher behavior in the classroom.

I decided to investigate this problem because it interested me and it suited the methodology I had hoped to use to look for the answer to my research problem. I would attempt to discover if there were any differences in the way field-dependent and field-independent teachers interacted with their students. This interaction would include the techniques teachers used to teach students, the techniques teachers used to maintain control of their classrooms, and the non-task or personal interaction teachers engaged in with students. Although I expected differences to emerge from the data, I also formulated four hypotheses based upon previous research:

Hypotheses

1. Field-dependent teachers will exhibit more direct teaching behavior than field-independent teachers.
2. Field-dependent teachers will engage in positive physical contact with students more than field-independent teachers.
3. Field-independent teachers will be more analytical than field-dependent teachers.
4. Field-dependent teachers will exhibit more warmth for students than field-independent teachers.

Definition of Terms

The first two definitions are taken from an article by Witkin and Goodenough (1977), the other three are defined by the researcher:

1. Field-dependence is the tendency to rely primarily on external referents in information processing. This includes not only the materials with which people work, but the perceptions of other people as well. Field-dependent people tend to rely on what they perceive and are influenced by what they are told.
2. Field-independence is the tendency to rely primarily on internal referents in information processing. Field-independent people question their perceptions and the perceptions of others on the basis of an internal sense-making. They take an autonomous approach to whatever data or beliefs they encounter.
3. Warmth is defined as teacher behavior toward students that is friendly and familiar. This includes the teacher joking, teasing, or being humorous with students in a positive manner.
4. Direct teaching behavior is defined as the teacher setting goals or prescribing activities for students without giving options to the students. This included not only giving the students specific tasks, but also lecturing to students, giving directions, demonstrations, explanations, or commands.

5. Analytical teaching behavior is defined as the use of reasoning skills by the teacher and encouraging students to use reasoning skills to solve problems or complete a task.

Basic Assumptions

1. The teachers were selected from a normal population of elementary school teachers.
2. A total of twenty-four hours of observation per teacher over four months would constitute a representative sample of the characteristic behavior of each teacher.

Limitations of the Study

The limitations of this study concerned the kinds of information which were not available to the researcher. Some of this information could have been a factor in the behavior of teachers toward students, and some information would have furnished a more comprehensive picture of teacher behavior. The information not available to the researcher included:

1. most student assignments and projects.
2. many one-to-one dialogues between a teacher and student.
3. the college grade point average or the IQ level of teachers.

REVIEW OF THE LITERATURE

Origin of the Field-Dependent-Independent Construct

The concept of a field-dependent-independent continuum began with the confusion of some airplane pilots during World War II. Several pilots would lose their sense of "uprightness" when flying through clouds, and they would often emerge from clouds upside down or with one wing up and one wing down. Military leaders were concerned with this phenomenon and decided to have it investigated in order to find ways to screen aspiring pilots who would become disoriented when flying in such conditions. Psychologist Herman Witkin and others were called in to investigate this issue (Ramirez, Herold, & Castaneda, 1974).

Out of this investigation came several perceptual tests including the Rod-and-Frame Test (RFT) and the Tilting-Room-Tilting-Chair Test (TRTC). All of the perceptual tests that were developed concerned the ability of the subjects to perceive the upright under distracting conditions. Subjects who were easily distracted by the field aligned the rod with the tilted frame rather than a true upright alignment. These subjects continued to be unable to accurately perceive the upright even after receiving training in alignment (Asch & Witkin, 1948).

Witkin concluded that clearly there was a perceptual style here and he hypothesized that this perceptual style might actually represent

a dimension of cognitive style. The hypothesis, as recently restated, was that "the tendency to function in a more or less differentiated way is likely to characterize a person's activities across psychological domains in contributing to self-consistency in individual functioning" (Goodenough & Witkin, 1977, p. 3). In an effort to validate this hypothesis, Witkin and his associates conducted a study using college students as subjects. The study was expanded to include both psychiatric patients at the Psychiatric Wards of the King County Hospital in Brooklyn, and eight, ten, thirteen, fifteen, and seventeen year old students from an elementary school and high school in Brooklyn. The results were reported in Personality through Perception, an Experimental and Clinical Study (Witkin, Lewis, Hertzman, Machover, Meissner, Wapner, 1954). Witkin and associates did further research on three groups of children. Their results were reported in Psychological Differentiation: Studies of Development (Witkin, Dyk, Faterson, Goodenough, Karp, 1962) which also included reference to the research of others who had become interested in this area. To clearly delineate the parameters of research in the area of personality, findings reported in these two books are summarized and other research which has supplemented or supported the personality variables suggested by Witkin and his associates is included.

Field-Dependence-Independence and Personality

The first important results reported in Personality through Perception (Witkin et al., 1954) are the high correlations among several instruments developed to measure field-dependence-independence. Witkin used the Portable-Rod-and-Frame Test (PRFT) and the Embedded Figures Test (Witkin, 1950), a paper and pencil test based upon the work of Gottschaldt (1926). The Embedded Figures Test (EFT), from which many modifications have been made for research purposes, had highest correlations with body adjustment tests like the TRTC.

Ten instruments to measure field-dependence-independence were given to the 103 college students (referred to as the "normal" group) in the study and a battery of personality measures including a personality questionnaire, the Figure-Drawing Test, the Word Association Test, and the Thematic Apperception Test. The subjects were asked to write an autobiography and each was given a clinical interview. The subjects, both male and female, tended to adhere to a certain way of perceiving in all of the tests involving perception of the upright and in the EFT. This confirmed the findings Witkin had reported previously (Asch & Witkin, 1948). The subjects were retested after five weeks, one year, and three years, and Witkin reported high correlations for the particular tests retaken by the subjects. This demonstrated that field-dependence-independence was a stable dimension of the cognitive style of individuals.

One of the first findings of the study of field-dependence-independence was that men tend to be more field-independent than women. In the Personality through Perception study (Witkin et al., 1954), subjects taking the EFT had only five minutes to find a simple figure embedded in a complex geometrical figure. In the "normal" group, men failed to find it in the allotted time only 35 times as compared to 88 times for the women. Out of 24 hidden figures, men found the simple figure in less time than women for all but two of the figures. When the outpatients from the psychiatric clinic were tested, the sex difference was even more pronounced; women scored in the extremes of field-dependence. This finding for outpatients has been supported by Ihelevich and Gleser (1971). This sex difference has received considerable attention and some refutation, but most of the research has confirmed sex differences on various measures of field-dependence-independence.

In a paper presented at the annual meeting of the American Psychological Association (1977), Karen Nelson noted that the claim that the field-dependent-independent continuum is bipolar and therefore value-neutral (Witkin, 1977) is contradicted by much research which has reported findings for field-dependent people couched in negative terms. Nelson suggested that the bias of these researchers toward analytic, logical thinking, an attribute consistently associated with field-independence, has resulted in

little attention being given to such positive aspects of field-dependence as intuitive thought. Nelson emphasized that she was not questioning the sex differences reported in research, only the implicit value judgments which are made at the expense of females since they are being associated with field-dependence.

A possible explanation for the sex difference emerged from a study in which subjects were given the opportunity to practice finding simple figures embedded in complex figures. The practice trial results showed a significant difference between the scores of males and females, but the second trial showed no significant difference (Chance & Goldstein, 1971). This finding indicated that sex differences on measures of field-dependence-independence probably are not genetic but environmental and can be overcome with a minimum of exposure to the task.

An interesting development related to the issue of sex differences has been the studies on the role of, or perception of, the father and mother in the family of a field-dependent or field-independent child. In Psychological Differentiation (Witkin et al., 1962), mothers of some of the children who were subjects for the study were interviewed and their responses were coded and categorized. Mothers of extremely field-dependent children tended to lack self assurance and self realization. In a study involving parent identification, Bieri (1960) found that males who identified with their father were more field-independent than males who identified with their mother. He also found that males who scored high on an Acceptance of Authority (AA) measure were more field-dependent than males who had low AA scores. Although his

findings were not significant for females in either area, Bieri did report that both males and females who identified with their father and had low AA scores were more field-independent than subjects who identified with their mother and had high AA scores.

Dreyer (1975) observed and recorded families of field-dependent and field-independent children at the dinner table and in the laboratory engaged in tasks designed to stimulate power and autonomy behaviors. He concluded that families with a field-independent child were not as structured as the families of the field-dependent child. In the latter the family roles were clearly defined and there was greater stability in the power structures. Both parents of the field-independent children tended to be intrusive in the laboratory task, but they also tended to verbally articulate approval more often; therefore, they were more nurturant toward their child as a problem solver.

Laosa (1978) observed a related phenomenon in his study of Chicano mothers who were given a completed Tinkertoy model and asked to teach their child to build an identical model. Field-independent mothers used inquiry and praise as primary methods in their interaction with the child. Field-dependent mothers relied more on modeling, showing the child how by actually doing part of the task for the child.

Another finding in Personality through Perception (Witkin et al., 1954) was that younger children tend to be field-dependent and

become more field-independent as they mature. Despite the consistency of the findings in this area, the conclusions being drawn have been challenged by several researchers on the grounds that the instruments used to test field-dependence and field-independence with children, usually the Children's Embedded Figures Test (CEFT) and the PRFT, are inappropriate as measures for young children (Kojima, 1978; Forer, 1975).

Although the measurement issue needs further study, the evidence for the significance of field-dependence-independence in how children learn is compelling. Linn (1978) studied seventh and ninth grade students. She measured their field-dependence-independence with the PRFT and then gave them two tasks which were based upon the work of Piaget. The results showed that field-dependent students limited their reasoning to real events while field-independent students considered all possibilities. Those findings suggested that researchers might be confounding development with cognitive styles. Linn concluded that the distinction Piaget makes between concrete and abstract thinking, i.e. reasoning about real events or taking all possibilities into consideration, may actually reflect a characteristic of the cognitive style of a person.

Shapson (1976) reported similar results using third grade children. Given a set of problems designed to have four possible hypotheses, only one of which would successfully lead to a solution

of the problem, field-independent children focused more carefully on the problems, usually came up with all the hypotheses, and were more successful in finding the correct hypothesis. Field-dependent children would develop the alternative hypotheses but were less able to reject the ones that were not feasible. They also tended to get "stuck" on one or two of the hypotheses instead of testing all the possibilities. As a final step, Shapson provided stimulus appropriate to the needs of field-dependent children, and he found that the performance of these children on the task was increased, bringing them closer to the performance level of the field-independent children. This result may be the most valuable finding of all for educational purposes.

Problem solving ability has consistently been highly correlated with field-independence. In both books by Witkin and associates, they report that field-independent subjects, both male and female, scored high on tests of analytical or logical thinking. Some research has failed to find significant differences between field-dependent and field-independent subjects after controlling for intelligence, prompting the claim that the field-dependent-independent construct is merely another means of measuring intelligence. In Psychological Differentiation (1962), Witkin et al. responded to this challenge by analyzing the performance of their subjects on the Wechsler Intelligence Scale for Children (WISC). In analyzing the WISC data, the authors used a factor analysis approach, comparing

sections of the WISC instrument to the CEFT scores obtained by the children.

Witkin and his associates found that it was the portion of the WISC test requiring analytical functions, not the overall scores on the test, that was primarily responsible for the high correlation between performance on the WISC and the CEFT. Field-dependent children tend toward a "functional fixedness;" therefore, they have more difficulty with analytical problems that depend upon the ability to overcome the context in which problems are presented. An example of this is the "box problem," where the subject is given a task and told to use anything in the room. Among the materials available are three boxes filled with articles that are irrelevant to the situation; however, to perform the task the boxes must be emptied and used. (Witkin, et al., 1962).

Analytic association with field-independence has been confirmed by a number of studies and in a variety of ways. Field-independent subjects have typically scored higher in mathematical tests (Templer, 1973). In a series of visual tests, subjects who saw similarities in the patterns of elements tended to be field-dependent, and subjects who saw similarities in the elements themselves tended to be field-independent. This study also indicated that field-independent people would focus more effectively on the task and were less distracted by cognitive interference. (Messick & Fritzky, 1963). Personality measures like the Temperament Schedule devised by

Thurstone have also borne out this relationship between field-independence and the preference for being logical and theoretical. Field-independent people were determined to be flexible but not impulsive; they weighed the consequences before acting on something (Pemberton, 1952).

This preference by field-independent people is revealed in their educational-vocational interests. In one study, Arbuthnot and Gruenfeld (1969) found that field-independent people preferred physics and biology courses, while field-dependent people preferred the humanities and social areas. In a longitudinal study, Witkin and associates followed a group of 1,422 college freshmen from their entrance into college in 1967 until 1977. For convenience the researchers grouped them by their designated majors into five areas: science (included math), education (primarily elementary education majors), psychology, sociology, and other. The science group had the highest scores on the Group Embedded Figures Test (GEFT), signifying their field-independence, and education majors had the lowest scores signifying their field-dependence. Even more interesting, the researchers discovered in their later contact with the subjects that those in the science group with the highest GEFT scores tended to stay in science whereas declared science majors with lower GEFT scores tended to change to another major before they had graduated. Finally, the researchers initially found that those students who had declared themselves as pre-medical

school students tended to be field-independent. The researchers later reported a significant correlation between high GEFT scores and those who applied for medical school after graduation. Students who did not apply for medical school had the lower GEFT scores (Witkin et al., 1977a).

The preference of field-dependent individuals for work that involves direct contact with people is seen as a function of their reliance on others, their gregariousness, and their concern for "doing not theorizing" (Pemberton, 1952). Witkin and associates have reported this tendency of field-dependent people to be socially outgoing in the two books previously mentioned and in reviews of the literature (Witkin, 1977; Witkin et al., 1977b). Field-dependent people have been related not only to extraversion (Sell & Duckworth, 1974), but to a susceptibility to the influence of others (Linton, 1955) and a greater interpersonal dependence in group tasks (Alexander & Gudeman, 1965).

Two studies which attempted to measure how sharply field-dependent and field-independent people differentiated in their evaluations of others concluded that field-dependent subjects were ambiguous in their ratings. In one study, the findings suggested that field-dependent people are more likely to be unable to distinguish between the trait and the performances of others (Gruenfeld & Arbuthnot, 1969). The other study used civil service supervisors and reported that field-dependent supervisors were more considerate of their workers and they were ambiguous in their judgments of workers (Weissenberg & Gruenfeld, 1966).

In the "normal" group (college students) and the hospital group used for the study reported in Personality through Perception, (1954) Witkin and associates claimed that field-independent people tended to be self-aware, self-accepting, active, assertive, introspective, and self-centered. Research on these personality variables has been mixed. Bottenberg (1971) found significant correlations for field-independence and emotional balance and stability, but no significant correlations between field-independence and ego strength or when compared to measures of activity/passivity. Foster (1977) found a significant correlation between active subjects, as determined by the Mellon-Illinois Self Report Inventory, and field-independence as measured by the GEFT. Roessler (1973) found a significant correlation between field-independence and ego strength.

There are a number of studies like the ones just cited whose findings have not always been replicated but they have not been contradicted. Gordon, Brazer, and Tripofsky (1961) found that field-dependent subjects were more impulsive than field-independent subjects and field-independent subjects were more self-accepting. Another study that looked at moods in relation to cognitive styles found that field-dependent college students were more variable in their moods from day to day. These field-dependent students were subject to low moods of frustration, inadequacy, and isolation, but the field-independent college students were steady in their moods (Gorman and Wessman, 1974). This finding is complemented by

another study that related field-independent males to a perception of others that was positive. Given a Philosophy of Human Nature scale, field-independent subjects tended to rate people as trustworthy and altruistic (Duke, 1969). This suggests that field-independent people may maintain a stable perspective by having a more positive attitude toward people around them.

Another possible explanation for the association of stability and field-independence was suggested by a study which concluded that field-independent people are more likely to see themselves as being able to control the outcomes of a wide variety of life situations (Chance & Goldstein, 1971). This finding is confirmed by Suzman (1973) who found that field-independence was related to such attributes as being autonomous, adaptable, risk-taking, and having a strong sense of control of one's life.

Campus (1974) provides further support for relating personality variables to field-dependence-independence by finding that field-dependent subjects were related to need of affiliation "harmavoidance," nurturance, and order. The study also found that field-independence was related to ego strength; however, the field-dependent subjects tended to have a stable self view, and this finding has been confirmed in another study (Claeys, DeBoeck, & Viane, 1976). Perhaps the most compelling study is that of MacKinnon (1960) who was working with the military to train people for intelligence work. Those people who performed effectively on the

Rod-and-Frame Test tended to have higher scores on several measures of intelligence. They were more analytical, more spontaneous, and possessed greater ego strength and independence. Those scoring low on the RFT tended to be more involved with others, oriented toward others. They were gregarious, concerned with making a good impression, unable to delay gratification, and unadaptive under stress.

Summary

Personality research on the field-dependence-independence continuum has yielded mixed results. There are several findings that relate ego strength and field-independence; however, a few studies found no relationship. Studies have concluded that there is a relationship between field-independence and an "active" personality while other studies have found no relationship. Studies have consistently described sex differences in measures of field-dependence-independence, with men tending to be more field-independent than women. Another study found that when women were given the opportunity to practice finding embedded figures before being tested, there were no significant sex differences.

Personality research has provided consistent findings that young children tend to be field-dependent and become more field-independent as they mature. Studies have shown a strong relationship between field-independence and a preference for analytical

thought. Field-dependence has been consistently related to extraversion, a stable self-view, and a reliance on others. Field-independence was related to self-awareness, introspection, and having a sense of control over outcomes in life situations. Research indicated that field-dependent people are nurturing and less likely to differentiate between traits and performance of others. Field-independent people are more likely to be autonomous, flexible, and adaptive under stress.

Field-Dependence-Independence and Education

Most of the research on field-dependence-independence in the area of education has focused on students rather than teachers. Research with students has confirmed much of what was suggested by research on personality, and some of this research is cited here, but the research on teacher behavior is more fully examined.

As predicted by personality research, field-independent students tended to achieve high scores on mathematics tests (Thornell, 1974). In another study (McLeod et al., 1978), field-independent students performed better on mathematics tasks with a minimum of guidance whereas field-dependent students learned more effectively on those tasks when a lot of structure was provided. It was also reported in the same study that field-independent students achieved lower scores when they were given a lot of structure, leading the authors to speculate that making the task too easy may have caused field-independent students to become bored.

A number of studies has demonstrated that field-independent students were more effective in learning concepts than field-dependent students (Grieve & Davis, 1971; Nelson & Chavis, 1977; Stasz, et al., 1976). Grieve and Davis (1971) used extreme field-dependent and field-independent subjects. They found that field-independent students performed equally well when given expository or discovery approaches to learning geographic concepts, but field-dependent students benefited much more from a discovery approach. Another study with 50 grade school children controlled for age and intelligence and concluded that field-independence was related to overall achievement behaviors and field-dependence was related to the dependent behavior of "affection seeking from adults" (Crandall & Sinkeldam, 1964).

Some of the most provocative research regarding student learning and cognitive style involves the idea of matching the student and teacher on the basis of cognitive style. Hester and Tagatz (1971) discovered that field-dependent students were unable to learn concepts as efficiently when taught by an analytic strategy which required "fine discriminations within the stimulus field." Field-dependent students were able to attain concepts more efficiently when the instructional style matched their cognitive style. These findings were corroborated by Elliot (1976) who concluded that both field-dependent and field-independent students who were matched with instruction geared to their cognitive style did significantly better

in concept attainment than the control group. Elliot also found that the procedure of matching material to cognitive style tends to reduce the superiority of field-independent students in concept learning.

Bodine (1977) found that field-dependent students preferred group work to individual work on tasks and furthermore that field-dependent students achieved significantly better scores on the tests after they had worked in groups. Bodine also found that groups with equal numbers of field-independent and field-dependent students performed better than homogenous groups. Field-dependent students preferring group work to individual work related to the association of field-dependence with reliance on others and extraversion in personality research. The findings that field-dependent students were superior in concept attainment in general and mathematics in particular is associated with personality research that has found field-independent people to be more analytic and to prefer theoretical concerns.

Two recent reviews of research on field-dependence-independence have lamented the lack of research on teacher behavior (Witkin et al., 1977b, Mahlios, 1978). Added to this is the problem that several studies have not discerned any difference in the teacher behavior of field-dependent and field-independent teachers. Ohnmacht

(1967) used the Flanders Interaction Analysis instrument to measure the difference between direct and indirect teaching with actual classroom teachers but found no relationship based on cognitive style. Ohnmacht did not report the relation of cognitive style to the particular types of behavior (e.g. praise, criticism, lecturing) contained in the Flanders instrument.

Engelhardt (1973) also found no significant differences in the teaching styles of teachers in relation to their cognitive styles. Engelhardt used the observation schedule developed by Hall (Instrument for Analysis of Science Teaching) to observe student teachers in a laboratory setting teaching a lesson in nonmetric geometry which had been selected and prepared by Engelhardt. No differences between the teaching styles of field-dependent and field-independent teachers reached statistical significance.

Wu (1967) asked student teachers majoring in social studies to devise lesson plans. The field-independent student teachers preferred the discovery method or a lecture approach in their lesson plans, whereas field-dependent student teachers preferred discussion groups and other methods involving more teacher-student contact. This finding supported the preferences field-dependent students had indicated for group work as reported by Bodine (1977).

Moore (1973) used twenty experienced teachers (ten male and ten female) and twelve inexperienced teachers (six male and six female) in a teaching simulation involving pressure-temperature-volume gas laws.

The teachers were provided with a variety of "moves," which were cards containing phrases, questions, or statements. The teachers selected the cards they wanted to use to teach the students. Field-independent teachers tended to use an inductive, question oriented approach, but field-dependent teachers were more deductive, lecture oriented. Field-independent teachers also tended to ask more higher-order questions as defined by the Taxonomy of Educational Objectives. These findings appear to contradict the preference of field-dependent student teachers for discussion and field-independent student teachers for lecture which was reported by Wu (1967).

Ohnmacht (1968) administered the Teacher Characteristics Schedule and the Dogmatism scale as well as the GEFT to male secondary education majors in their last year of college. He found field-independence was related to open mindedness, and that a combination of field-dependence and dogmatism resulted in low scores on a scale measuring stimulating, imaginative teaching. Smith and Kleine (1969) discovered that field-independent teachers were more aware of what information was important to their students, and they would indicate that knowledge to students.

Stone (1976a) drew a number of conclusions from his study of second and fifth grade teachers. Teachers at both grade levels tended to be field-dependent, but particularly in the second grade. Field-independent teachers had high correlations with verbal fluency, memory, reasoning, and flexibility. Field-dependent teachers were more likely to perceive their principal as being democratic and they expressed more satisfaction

with their job than field-independent teachers.

In terms of teaching style, Stone found that field-dependent teachers at the second grade level spent more time in direct instruction, in practice and review of skills and facts, and used more instructional materials (books, workbooks, paper and pencils) than field-independent second grade teachers. Field-dependent teachers tended to use a spot check, question-and-answer approach, relying on interactive techniques, primarily redirection, to manage their classes. The use of interactive techniques was consistent across grade levels and subject matters. Stone noted that grade level probably influenced teaching performance and suggested that the teaching task influenced teaching performance as well. Although field-independent teachers tended to be more effective teaching mathematics, Stone emphasized that cognitive style influenced how the teacher taught, not how effectively they taught.

Packer and Bain (1978) matched and mismatched student teachers majoring in math with college freshmen in a one-to-one teaching situation which involved teaching the math concept of network tracing. Matched pairs (field-dependent teacher and student, field-independent teacher and student) did significantly better than mismatched pairs not only in student attainment of the concept, but also in student evaluations of the teacher. Teachers from matched pairs also made more accurate predictions of student scores than teachers from mismatched pairs. Field-dependent teachers received the highest overall rating from students, but this was primarily due to the rating

of field-dependent students. Field-dependent students tended to rate field-dependent teachers much higher than field-independent teachers, while field-independent students did not demonstrate this consistency.

Doebler and Eicke (1979) decided to investigate what effect an awareness of cognitive styles would have on teacher behavior. Using fifth grade teachers in public schools, they had two experimental groups which received the cognitive style information and one control group which did not. Students and teachers were tested for field-dependence-independence and scores near the mid point were excluded. The researchers speculated that if the students had a good self-concept and a positive attitude toward school, their learning would be enhanced. Their hypothesis was that student attitudes would improve after teachers were aware of the educational implications of cognitive style, their own cognitive style, and the cognitive style of their students. This hypothesis was confirmed as students in the experimental group responded more positively on the post-tests of the Self Appraisal Inventory and the School Sentiment Index. The study suggested that teachers can adapt their classroom approach to meet the needs of students with different cognitive styles. This would offset the research that showed the improved performance of students matched with teachers on the basis of cognitive style.

Summary

Research on how students learn as related to cognitive style has concluded that field-independent students are generally better at

concept learning than field-dependent students, but the performance of field-dependent students is improved after being taught by a discovery method or by working in small groups. Studies have also found that when field-dependent students were matched with field-dependent teachers or with materials appropriate to their cognitive style, they could learn more effectively.

Research on teachers indicated that field-dependent teachers tended to prefer a discussion approach and field-independent teachers seemed to favor discovery or lecture methods. Another study concluded that field-dependent teachers were more lecture oriented and field-independent teachers were more question oriented. Field-independent teachers seemed to prefer teaching math, and they performed significantly better on measures of flexibility, verbal fluency, and reasoning ability. Field-dependent teachers tended to rely on interactive techniques for classroom management, and they spent more time on direct instruction and reviewing skills and facts. Knowledge of educational implications of cognitive style and the cognitive style of students and the teacher were provided to teachers and the results indicated that teachers did adapt their behavior toward students. The students had an improved self-concept and a more positive attitude toward school.

There are some problems in research on teacher behavior as related to cognitive style, but the more recent research looks promising. The problems concern the limitations of simulation games and the use of

lesson plans from student teachers which might reflect the ideals of the teacher preparation program rather than a personal preference. Research conducted in the laboratory, using student teachers who teach lessons designed by the researcher may be too restrictive to yield valid results.

Doing research in the classroom presents problems too. Observation systems based on broad categories, such as direct and indirect teaching, may not be sensitive enough to reflect differences between field-dependent and field-independent teachers. Even a category like praise can be deceptive because there may be no difference in the amount of praise teachers give, and yet one teacher might praise students in a different way or for different reasons than another.

Witkin has consistently called for improved research to clarify and refine the field-dependence-independence construct. In particular, Witkin has emphasized the importance of doing research in a "natural setting." In Personality through Perception (1954), Witkin et al. noted that the problem with much psychological research has been the tendency to analyze phenomena created in the laboratory, the results of which "could therefore never contribute greatly to an understanding of people as they function in the real world" (p. 509). In a footnote, Witkin explains that a "natural setting" can be established in a laboratory experiment, and that the intrusion of an observer could affect the "natural state" of the subjects being studied. "It is, then, not where they are studied but how they are

studied that determines whether phenomena are being investigated in the form in which they occur in nature" (p. 509).

Ethnographic Research in Education

In a paper presented to the American Anthropological Association, Khleif (1969) concisely described the unique problems of doing participant-observation research in schools. The first major problem is one of being too familiar with the setting. Anthropologists have to cope with living in a foreign culture when they have done fieldwork. Although this "culture shock" has often created many difficulties, the advantage of "culture shock" is that everything seems strange and new to the fieldworker who records much that would pass unnoticed to the native observer. By being a shared experience in our culture, the school setting increases the likelihood that a participant-observer may overlook elements that could be potentially useful in understanding the phenomena being observed. One must be as detailed as possible in the field notes in order to offset this problem of familiarity.

Khleif also stated that participant-observers are seldom the sort of true participant in the classroom that they become when doing fieldwork in another culture. There is no appropriate role for them. The fieldworker in schools must find some part to play which avoids the futility of attempting to be an unobtrusive observer, and yet does not result in so much involvement that he or she indelibly alters

the natural state. Added to this is the need to establish rapport with teachers and students and yet not become aligned with anyone too much because of the risk of losing the neutrality which is essential to the research. It is not easy.

Despite these problems, ethnographic research has been impressive for its comprehensive data gathering and the insights which it has provided about education. The findings of ethnographic research have been published as books, collected in anthologies, printed in educational journals like the Harvard Educational Review (McDermott, 1977), and presented at conferences such as the annual meeting of the American Orthopsychiatric Association (Horton, 1967). Recently the director of the National Institute for Education, Pat Graham, stated in her fourth annual report that educational research was improving, primarily because of the increase of qualitative research (reported in Newsnotes, Phi Delta Kappan, 1978).

One major advantage of ethnographic research is the diversity of techniques it employs. Participant-observation is only one approach in ethnographic research. To understand the variety of approaches available to ethnographic researchers, it is useful to look at some of the studies that have been done. The findings of these studies are not reported since they are not germane to the present research, but the reader is encouraged to read the studies to appreciate the quality and scope of the conclusions these studies have drawn.

In a study of elementary schools, Spindler (1974) accepted a suggestion by the faculty that the researchers focus on adjusted rather than maladjusted children. The teachers aided in the selection process, and Spindler approached some of the designated children and their parents to ask for their cooperation. For three months Spindler and his associates collected data, periodically sharing their information with the staff of the school. The Rorschach ink blot test and the Thematic Apperception Test (TAT) were administered to all of the children in the study. The researchers visited the homes of the children, interviewed the parents, and constructed sociograms based upon seating patterns and friendship preferences.

Wolcott (1967) studied a Kwakiutl village and its school, and his study provided an example of participant-observation research with a fully developed participant role. Wolcott taught at the one room school at Blackfish village for one year. His primary source of information about the village was his verbal interaction with his students and their writing. Wax and Wax (1971) had a similar study involving the schools on the Pine Ridge reservation. Their role was that of an outsider rather than being given a role within the cultural setting as Wolcott had been. The researchers observed classes, interviewed administrators from the school and the Bureau of Indian Affairs, interviewed teachers, parents, and students. They also had learned the Lakota language which facilitated their interaction with Indian parents. It also proved useful in their observations at the

school. At times the Indian children would speak in their native tongue so that the teacher could not understand, but the researchers were able to record these verbal exchanges in their field notes.

Rosenfeld (1971), like Wolcott, conducted his research from the vantage point of being the classroom teacher. He taught a different class of low achievers each year for three years in a Harlem elementary school. Rosenfeld focuses most of his attention on the children, on their interaction with him, their creative writing, and on sociograms of their seating patterns, but he also interviewed parents and other teachers in the school. Finally, Rosenfeld used the scores his students achieved on standardized end-of-the-year reading tests to support his conclusions.

The study Rosenfeld conducted, although well-documented and provocative, was more impassioned than most ethnographic research because of his intense involvement with his students. As an interesting contrast, Cusick (1973) looked at a high school not in the role of a teacher, but as a student. He wanted to use a participant-observation approach in developing an understanding of the perspective of a high school student on schooling. Although Cusick dressed like the high school students in order to be accepted (his appearance was youthful), he was introduced to the students by an administrator as a researcher and never tried to conceal the fact that his purpose in being there was to do research. To accomplish his goal, Cusick eventually had to select one group of students and he spent most of his time with them.

Leacock (1971) wanted to compare teachers at four different schools representing different socioeconomic and racial groups: lower-income Black, middle-income Black, lower-income White, and middle-income White. She wanted to understand the variety of roles in classrooms and the contrasts that existed in the association of behaviors, attitudes, and expectations. Two observers, one for the teacher and one for the students, recorded field notes for an hour and a half in each classroom. Three such observations were made in each classroom. Each teacher was interviewed before and after the observations, and every child was briefly interviewed once. After coding all material from the observations and interviews, the researchers drew their conclusions.

Two studies of principals are useful to compare because of the contrast in methodology. Vidich and McReynolds (1971) conducted interviews with 23 principals in New York City. They also took field notes on the interaction of 12 New York City principals at four seminars. Each seminar had a different speaker and topic, and ample time was provided for discussion. The researchers were interested in ascertaining the changing reality of urban public education and its conflict with the professional philosophy of the principals.

Wolcott (1973) decided to investigate the role of the principal using an elaborate ethnographic approach with one elementary school principal. For one year Wolcott recorded the interaction of the principal with his staff, individual teachers, students, and parents

(except in sensitive situations). Wolcott accompanied the principal to meetings with other principals, observed him at home, teaching Sunday school, and at Kiwanis luncheons. Wolcott collected copies of records of enrollment reports and the personal log of events kept by the principal. Wolcott also had the school and neighborhood mapped and photographed. He interviewed staff members as well as students, and he administered a questionnaire to the staff at the end of the study.

In Life in Classrooms (1968), Jackson based much of his analysis of elementary schools on the data collected over a two year period from "systematic observations" of first, second, and fourth grade teachers. He accompanied teachers to the playground, the faculty lounge, and he talked with them after school. Jackson refers to qualitative and quantitative studies to amplify his remarks about elementary schools.

Summary

Ethnographic approaches to classroom research represent descriptive, exploratory research. Researchers ask broad questions and often their hypotheses are not predetermined but emerge from their collection of the data. There are a variety of data that can be collected, including interviews, questionnaires, memos, personal conversations or communications, sociograms, psychological tests, and student scores on achievement measures. Participant-observation is a primary source of data gathering and it has been used for as few as three classroom observations or for two years of observation.

METHODOLOGY

As regards to those who follow a scientific method, they have the choice to proceed either dogmatically or sceptically, but at all events, systematically (Kant, 1966, p. 543. Originally published 1781).

Purpose of the Study

The purpose of this study was to discover what differences existed in the behavior of classroom teachers who represented field-dependent or field-independent cognitive styles as measured by the Group Embedded Figures Test (Witkin, et al., 1971). It was hypothesized that field-dependent teachers would be more direct, more touch oriented, and exhibit more warmth than field-independent teachers. It was also hypothesized that field-independent teachers would be more analytical than field-dependent teachers.

The subjects for this study were selected from a group of teachers from the Ames elementary schools whose test results indicated that they were strongly field-dependent or field-independent. Data from their classrooms were obtained by an ethnographic approach that utilized participant-observation, interviews, and an analysis of teachers in their natural setting. Relevant elements of "A Cross-Cultural Outline of Education" by Jules Henry (1972) were used to construct two checklists which were used to categorize teacher behavior and the interaction patterns between teachers and students (see Appendix A).

Selection of Methodology

As the research question began to be clarified, the participant-observer approach seemed to be the most appropriate method to use. Although an ethnography which utilizes a participant-observer approach admittedly has limitations, the advantages make it a uniquely persuasive format to apply to the field of educational research. The researcher does not attempt to draw conclusions based upon one instrument or a few days or weeks of data gathering, but upon many sources of data observed within the context of typical events and occurrences over several months, ideally at least a year. By being there with the subject of the study, over time, and in a variety of situations, the participant-observer is privy to much information that cannot be gathered from other methods.

The value of ethnographic research is not that it helps to "nail down" anything, but rather that it offers a direction based on the "natural setting." It is more important for social scientists to be able to link up their findings with their previous research and the research of others so that a strong chain of understanding will be forged from the theory, logic, and the best empirical data available (Schatzman and Strauss, 1973). This is the nature of "plausible reasoning" as defined by the mathematician, George Polya (1954). He wrote about the problems inherent in doing research in a natural setting: "In asking a mathematical question, you may hope to obtain a completely unambiguous answer, a perfectly sharp Yes or No. In addressing a question to Nature, you cannot hope to obtain an answer without some margin of uncertainty" (p. 23).

Polya went on to say that in "plausible reasoning," the conclusion is not absolute, but indicates that something is now more credible or less credible than before. This conclusion encourages a direction rather than establishing a truth or falsehood. How much it encourages this direction depends somewhat upon the evidence discovered, and even more upon the perception of that evidence by another. "The direction is expressed and is implied by the premises, the strength is not . . . The direction is impersonal, the strength may be personal. My friend and I may honestly disagree about the weight of the conclusion, since our temperaments, our backgrounds, and our unstated reasons may be different" (his emphasis, p. 114). The goal established for this research project, in accordance with Polya's notion of "plausible reasoning," was to find a direction which could be further validated, to make a contribution to the credibility of a belief.

Although precautions were taken to provide a measure of objectivity for this research, it should be noted that there was necessarily an element of subjectivity involved in it. This researcher not only takes responsibility for the subjectivity of the ethnographic approach, but suggests that such subjectivity may well be an important element contributing to the ultimate value of this research. Ethnographic research represents a middle course that gathers data objectively, then organizes and interprets the data. Such research was promoted by no less an intellect than that of Sir Francis Bacon in his famous treatise, "Novum Organum" (originally published in 1620):

Those who have handled sciences have been either men of experiment or men of dogmas. The men of experiment are like the ant, they only collect and use; the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes a middle course; it gathers its material from the flowers of the garden and of the field but transforms and digests it by a power of its own" (1963, p. 237).

Selection and Identification of Subjects

The subjects for this research were selected from 17 fourth, fifth, and sixth grade teachers from three Ames elementary schools. Teachers from these grade levels were preferred because teaching students in the upper elementary grades involves a variety of subject matter and allows for a variety of pedagogical approaches while dealing with the same students each day in a self-contained classroom. All teachers and their principals were informed of the nature and purpose of the research and they were asked if they would agree to be considered as a possible subject for this research. After the teachers from all three schools agreed to be potential subjects, a time was arranged for the teachers to take the Group Embedded Figures Test (GEFT). The researcher subsequently met with the teachers at their respective schools and administered the test.

The GEFT was adapted from the Embedded Figures Test (EFT) which was the original pencil and paper instrument developed to determine cognitive style differences. The EFT was adapted from the work of Gottschaldt (1926) and had a significant correlation with several of the tests first used in developing the field-dependent-independent

concept (Witkin et al. 1954). Research comparing the GEFT and EFT has indicated a high correlation between them (Witkin et al., 1971).

The GEFT includes 18 complex figures within which are contained simple figures. For an illustration of these simple and complex figures, see Appendix B. The subjects were asked to find specific simple figures embedded in the complex figures within certain time limits. The first section of the instrument has seven fairly uncomplicated items and the subjects were given two minutes to find the simple figures. The purpose of this section is to provide assurance that the subjects understand the task they are to do. The subjects were then told to go on to the second section which contained nine more difficult items. The illustrations of the simple figure were presented on the back of the last page of the test booklet, so the subjects were not able to see simultaneously the simple and complex figures. They were told that the simple figure would be the same size, in the same proportion, and would face the same direction within the complex figure as it did in the illustration on the final page. Their instructions were to find the simple figure within the complex figure and trace it in pencil directly on the lines of the complex figure. They were given five minutes to work on this section.

The third section contained nine equally difficult items and the subjects were given the same instructions and the same amount of time as they were given on the second section. Their final scores were based upon the total number of simple figures correctly outlined

within the complex figures in sections two and three. From these scores the researcher determined which teachers represented a field-dependent or field-independent cognitive style.

In selecting the subjects for this research project, the researcher wanted to control for five variables: strength of field-dependence-independence, grade level, years of teaching experience, school setting, and sex. Since past research had revealed problems when subjects who scored near the midpoint on the tests of field-dependence-independence were included in research, it was decided that only subjects scoring in or near the upper or lower quartiles would be selected for this study. The grade level was an important variable because previous research indicated that younger students necessitate different behavior from elementary teachers (Stone, 1976a).

Years of teaching experience was considered an important variable because of the concern for seeing a teacher whose interaction style had clearly evolved, rather than spending time observing first or second year teachers who might still be experimenting to find an approach that suited them. School setting was important in order to control for differences in teacher behavior due to different principals, different staffs, and the variations that would naturally occur in the climate of two different schools. Sex was considered important because previous research had indicated some interesting differences between the scores of males and females on the various measures of field-dependence-independence.

After the GEFT had been administered to all of the fourth, fifth, and sixth grade teachers from the three elementary schools, the results showed that one school had two teachers who scored in the upper quartile, and two teachers who scored in the lower quartile. An additional teacher from this school was one point away from being in the upper quartile. Of these five teachers, two female and one male were field-independent, and one male and one female were field-dependent. One teacher had taught for fourteen years, the other four had each taught over twenty years.

All five teachers were contacted and agreed to participate in the research, signing a modified consent form which included their right to withdraw at any time (see Appendix C). All five teachers were given further clarification of the procedure and scope of the research. Each teacher was to be observed once a week for one half of the school day, either in the morning or the afternoon. These observations would continue for two months. At the end of February the researcher would meet with the teachers to determine if there were any problems. Modifications of the observation patterns as desired by the teachers would be made at that time in exchange for their continued cooperation for the final two months of the research. The researcher guaranteed that the research would be concluded at the end of April. Although all five teachers understood their right to withdraw at any time

as stipulated in the modified consent form, each one verbally assured the researcher that he or she would participate in the research at least until the February meeting.

Data Collection and Organization

The most important element in engaging in successful participant-observer research is the way in which the researcher is accepted and incorporated into the environment being studied. At the beginning it was important to be a "passive presence," in order to assure all of those involved that the researcher represented no disruptive threat to anyone (Schatzman & Strauss, 1973).

Once the presence of the researcher in the role of a participant-observer was accepted, it was equally important to become familiar with both the students and the subject-teachers as soon as possible. Schatzman and Strauss emphasized the fact that people undergoing an observation have a need to feel that the observer is at least a partly known person rather than a stranger (1973, p. 60).

Note taking was begun immediately. In order to aid the "participant" component of "participant-observation", teachers were instructed to ask the researcher to help them in any sort of task wherein he could be useful to them. Few such requests were made, however, because each teacher already had an aide for part of the day. The fourth grade teachers also had an involvement aide (a program for elementary education majors at Iowa State University) on Tuesday and Thursday. These were the two days

when the researcher was at the school for the entire day to observe four of the five teachers. The presence of these additional aides precluded the opportunity for the researcher to be consistently called upon by the teachers. The few occasions when the researcher was called upon included showing a film to the two fourth grade classes and leading a discussion afterwards while the two fourth grade teachers were at a meeting with a parent. On other occasions the researcher monitored classes while the teacher stepped out for a moment to talk privately with a student or if a teacher was called to the office for some reason. The researcher also worked with students individually at various times.

As a result of the passive involvement in the classrooms with infrequent opportunities to establish any other sort of role, the researcher was accepted by the students as a friendly, unassuming note taker. The students were open and friendly, and very curious about the nature of the research and the contents of the field notes. Notes the researcher was taking were shown to anyone expressing an interest in what was being written, including the teachers who were being observed. The researcher was careful to take strictly observational notes. Later, after typing up the notes, the researcher would write in comments, clarifications, and speculations pertinent to the phenomena being described.

The detailed observational notes were essential to the development of the concepts that helped to explain the nature of what was being observed. It was important that much information be included,

because "watching (like a human camera) and listening (like a tape recorder) constitute the core elements of practically all operationalized definitions in anthropology. But operationalizing requires specification of what was watched or who was listened to, under what circumstances" (Pelto and Pelto, 1970, p. 53).

While observing all five teachers for the first two months, the researcher selectively shared some of the typed copies of the field notes with the teachers so they had some idea about the sort of observations being recorded in the field notes. The researcher met with the teachers in February to ascertain whether or not they were willing to continue participation in the research and what problems existed. Since the teachers had expressed much interest in the field notes they had been given, the researcher offered to give copies of the notes from every observation during the next two months to the teacher observed. The teachers unanimously and enthusiastically approved of this. The teachers were also unanimous in wanting to "tighten up" the research period, shorten it in some way. The researcher suggested an intensive observation period of one week for each of them rather than spreading the observations out over the last two months of the designated research period. The teachers appeared to accept that modification, and the researcher stipulated a particular week for each teacher.

After this meeting, one of the teachers, a field-dependent subject, withdrew from the research. The remaining four teachers agreed to be observed on their particular week. This procedure was a useful

modification to the original research plan because it allowed the researcher to observe the teachers for four consecutive school days. Looking at the continuity of instruction was not possible during the first two months because of the length of time between observations, but this was now an element that could be considered. Although the prior observations had limited the researcher to observing certain subject matter areas in the classroom of each teacher, the one week period allowed the researcher to observe each teacher teaching all the subject matter areas.

At the end of the research, the researcher wrote five brief papers describing the teaching style of each teacher. The researcher then met individually with each teacher to get his or her response to the comments and conclusions noted in that paper. This is important for ethnographic research. Anthropologists differentiate between what they call the "emic" which is the point of view of the native, and the "etic" which is the perspective of the outsider. Both are considered essential to obtain a comprehensive understanding of the phenomena being studied. The teachers were asked to challenge or contradict any aspect of the description that seemed inaccurate, and to confirm those conclusions which they could accept. In this way, the teachers were given the opportunity to share their perspective of their classrooms and the role they play in them.

Becker and Geer (1960) have succinctly described the evolution of successful participant-observation research. The participant-observer begins by looking for "problems and concepts that give

promise of yielding the greatest understanding of (what he is studying), and he looks for items which may serve as useful indicators of facts which are harder to observe" (p. 272). The second stage is to check the frequency and distribution of phenomena so that one can begin to perceive a direction for the data leading toward a potential conclusion to be drawn, and the final stage would be to incorporate the findings into a generalized model (p. 272-273).

The researcher developed two checklists to organize the data in the field notes. Anthropologists enter the field with a broad framework with which to understand the phenomena they observe. They do not, however, merely check off events that happen to fit a set of predetermined categories. Accordingly, the checklists were developed at the end of the research so that the knowledge of the categories would not affect the note taking. A number of checklists were consulted, but none of them focused on teacher behavior as specifically as the researcher desired. Many categories for the two checklists were derived from "A Cross-Cultural Outline of Education" (see Appendix A) which is a comprehensive categorization of educational activity compiled by anthropologist Jules Henry. One checklist was concerned with instructional procedures and specified the teaching techniques being used. The other checklist was concerned with interaction between the instructor and students which was not related to the learning activities in which the students were engaged (see Appendix D).

The categories for the checklists were given to three professors at Iowa State University and to three consultants at the Iowa

Department of Public Instruction in Des Moines, Iowa, for validation. All six of these people have professional expertise in the area of interpersonal relations in the classroom. The checklists were then modified in accordance with the suggestions from these professionals, and the categories were grouped under major headings.

Description of the Major Headings for the Checklists

One checklist focused upon teacher behavior that pertained to the efforts of the teachers to instruct the students. Classroom time is generally organized around designated assignments, and students progress from one to another at the direction of the teacher. Teacher behavior which reinforced students or provided students with information regarding the specific task at hand was tallied under one of the categories on the Instructional Procedures checklist. The Instructional Interaction checklist focused on the management of classroom procedures and guidelines, and on the nature of the non-task interaction between teacher and student. This behavior was not related to the specific task at hand, but to the response of the teacher to the student in a more general way.

Instructional Procedures Checklist

The Teacher is Directive includes behaviors where the teacher was specifically goal setting or prescribing activity for the students. There were no options given to students but they were given things to do such as giving reports or trying to ascertain the desired response to

a question. This heading also included students having to respond to what the teacher was doing. This involved listening to a lecture, an explanation, directions, commands, or watching a demonstration.

The Teacher is Receptive, Supportive involved the teacher accepting student input on the task or reinforcing the efforts of students on that task. Giving commands in the form of a question or request gave the student the opportunity to reply which a direct command did not; therefore, it represented a receptive behavior. Working with individual students was a direct means of reinforcement, as was praise. Giving "strokes" was a category that was difficult to assign, but after carefully rereading the field notes, the researcher concluded that this behavior seemed to serve as support for students in a task-related way. For example, a girl was supposed to write a short story based upon a phrase on a card handed to her. The phrase involved writing a story about something she would want to change in her life, but the problem was the girl did not want anything changed. The teacher responded by saying what a "sweet thing" she was and told her to write about how satisfied she was with everything. This was personal praise, a "stroke," and yet was related to the task.

At other times students would be doing seat work and periodically different students would individually come up to the teacher to talk about something personal. The teacher would talk to the student for a brief time and the student would return to his or her desk. The researcher asked one of the teachers about these encounters and the teacher said that some students needed these "breaks." They needed to

get away from the task for a moment and when they returned to it they could more readily complete the task. This behavior was not the same as the more general categories under the nurturing heading in the Instructional Interaction checklist. This form of giving "strokes" was used as an instructional technique intended to support the student in his or her attempt to complete a specific task.

The Teacher is Analytical, Logical concerned reasoning behavior. The teacher encouraged reasoning in students by refusing to answer a question, asking questions instead. The student was encouraged to "think through" the problem and come up with an answer. The teacher could also be a model for reasoning by noting foreshadowing elements in a story and alerting students to look for the foreshadowed incident, or by stating the expectations the teacher had for the next hour of class or for the period after lunch or recess. By having such expectations clearly established, students could anticipate, and be prepared for, the tasks to come.

The Teacher is Demanding, Sets Standards included a teacher expecting specific results or actions from students on the task at hand. The teacher rejected ideas that did not measure up, or set up an example that students were to imitate. The teacher expected volunteers to come up to the chalkboard to work on a problem, and if volunteers were not forthcoming, the teacher could "put the child on his mettle" by calling on a student to perform such a task in front of the group. Calling for answers from quiet or inattentive students was

considered to be putting the child on his mettle. Threats were few, generally vague, and were task oriented. Once some students were not studying their spelling during spelling study time and the teacher said "Are you going to get a one hundred on your spelling test Friday?" After an affirmative response the teacher replied, "You'd better."

The Teacher Includes Supplementary Experiences involved the use of games, pictures, skits, group discussions with open ended questions, self disclosure, and so on. Tallies were given for movies only if they were discussed afterwards. This area was intended to encompass the variety of ways the teachers supplemented their instruction with related activities or information.

Instructional Interaction Checklist

Teacher as Antagonist represented several types of negative reinforcement for classroom management. The use of ridicule, sarcasm, and resentment are tactics that are available to teachers but were seldom used by any of the teachers in this study.

Teacher as Critic focused on the teacher criticizing the conduct of students. This area could be viewed as representing a hierarchy of behavior starting with the implied criticism of silence, of discouraging a particular behavior, or of threatening to withdraw affection. The next step would be overt criticism and accusation, or the overt criticisms involved in making the student feel guilty for what he or she has done. This would be followed by actually giving a gentle or

firm reprimand for behavior, and finally, the ultimate step of referring the student to the principal or to the parent for punishment.

Teacher as Nurturer was divided into two parts. The teacher supported the student as a person by showing warmth, being open and friendly, joking, teasing, and touching them. This part of the larger heading essentially involved the teacher being very personal, or even parental, with students. In the second section, the teacher nurtured the child not in a parental way, but very much in the role of a teacher. The behavior was not related to specific tasks but involved a general sense of encouragement, enthusiasm, and the teacher treating the student as an equal in the learning situation. Enjoying a correct response in this area refers to the responses of a teacher to the class as a whole reviewing past material or practicing new material. The teacher is not responding to a specific assignment the student is working on, but their response represents a general appreciation for student performance in a practice situation. Often this response was impersonal, such as, "We're getting to be experts at this."

Teacher as Stranger referred to behavior indicating that the teacher had disassociated himself or herself from the class, or that the teacher appeared to be alienated from the class. The former description included being bored, indifferent, aloof, using "you" or pointing at a student, and ignoring students. The latter description included being defensive or embarrassed.

Teacher as Manager described the way teachers maintained their classroom procedures through impersonal techniques or by assuming an

administrative role. Teachers told students that certain behavior was inappropriate, exhorted students to do better, used gestures or facial expressions to indicate disapproval, or gave punishments for infringements of those guidelines. Teachers could establish new guidelines for special events and warn students of the consequences of poor conduct.

Using the two checklists, the researcher read through the field notes and marked a tally in the appropriate category for each behavior or verbal response recorded. The researcher also noted on a separate sheet of paper the location in the field notes for each tally in each category. These frequency counts were the basis for conclusions drawn from this research.

PRESENTATION OF RESULTS

The research essentially had two phases. During the first phase the researcher visited the classroom of each teacher for two consecutive hours once a week for seven weeks--a total of fourteen hours of observation for each teacher. After the February meeting, the researcher agreed to focus on each teacher for one week, observing each teacher for four consecutive days. The observation schedule during the second phase was comprised of two complete school days and two partial days. The total observation hours for the second phase was ten hours for each teacher. The advantage of phase one was that it allowed the participant-observer to sample teacher behavior over a two month period, and the advantage of the second phase was that it allowed the participant-observer to record teacher behavior while the teachers were teaching in a variety of subject matter areas and to observe the continuity of teacher behavior.

After completing the observations for all five teachers at the end of April, the researcher constructed two checklists based upon "A Cross-Cultural Outline of Education" compiled by Jules Henry (1972). The researcher read the field notes for each teacher, using the two checklists to code the recorded verbal and nonverbal behavior into the appropriate categories.

Before analyzing the data, the researcher went through the field notes one more time to recode certain items from the two

checklists. The first reason for doing this was the need to create and code subcategories for items that were too broad to be useful. In the Instructional Procedures checklist, the Tells How category was divided into three subcategories: Reveals Answers, Explains Something, and Gives Directions. Another example was Praise, which was divided into Praise for Quality of Work and Praise for Completion of Work or Cooperation.

Other categories were recoded because the researcher decided to alter the definition for the category so that it more appropriately reflected the dimension of behavior as originally intended. An example of this is illustrated by the change for the category Gives "Strokes" on the Instructional Procedures checklist. The researcher initially recorded a tally for this category only if the teacher complimented the student for some personal quality, but as the researcher went through the field notes it became obvious that there were a lot of "strokes" being given that could not be recorded given this narrow definition. The researcher expanded the definition for "strokes" to include those one-to-one encounters between teacher and student when the teacher merely listened and responded to a child who came up not to talk about an assignment but to privately share some experience. Nonverbal communication was observed to support the conclusion that an encounter was a "stroke."

After the recoding was completed, the researcher prepared to analyze the data. Since a field-dependent teacher had chosen to

withdraw from the research after the completion of the first phase, only one field-dependent teacher remained in the observation group for the second phase. For the most effective comparison chi-square statistics were computed on the frequency counts taken during the first phase of the research. The frequency counts from the second phase of the research are compared later to the first phase in order to discuss the consistency of teacher behavior during the two phases of the research.

In analyzing the data, it became apparent that some differences did not reflect a field-dependent-independent contrast in teacher behavior, but differences based upon the sex of the teachers. In order to analyze this more carefully, the researcher organized the data from the first phase of the research for male and female teachers and chi-square statistics were computed on this data. The results are presented in Tables 7 and 8 and are discussed near the end of this chapter.

Interviews with the Teachers

The researcher wrote individual papers for the teachers describing their teaching style as represented by the frequency counts on the checklists. After each teacher had read his or her description, the researcher met with each teacher individually to discuss the paper and to get an assessment concerning the accuracy of the description. On the whole, the teachers seemed to be impressed

with the accuracy of the descriptions, some recognizing themselves more clearly than others. The following is a brief summary of what the teachers read in their paper about their teaching behavior as related to cognitive style. Their responses to the descriptions are also discussed.

To describe the basic difference between the teachers representing the extremes of field-dependence-independence, the researcher used a "parent" metaphor to describe field-dependent teachers and an "adult" metaphor to describe field-independent teachers. The behavior of field-dependent teachers was described as being parental. They were both more affectionate and more critical than field-independent teachers. They commanded students and gave them "strokes." They were often friendly and familiar with students, joking and teasing and touching them. More than anything else, field-dependent teachers seemed to be interested in students as they were here-and-now: their likes, dislikes, personal problems, and anything else that was important to a child at the moment. They gave answers and showed students how to do things because their main concern was that the student got the work done.

Field-independent teachers treated their students as adults. They reasoned with students and encouraged students to reason things out for themselves. "Give me a good reason, and I'll listen every time," said one field-independent teacher to a student. Field-independent teachers focused on the task at hand and rarely

got off on tangents. They used more positive reinforcement and their comments generally concerned the work of the students rather than the students themselves. Field-independent teachers would challenge students, put them on the spot, but they also gave credit to the student who answered correctly and praised those students who had done exceptional work. This focus on the students as learners underscored the conclusion that field-independent teachers were more interested in what the students could become rather than what they were at the moment. Field-independent teachers seemed more interested in developing the abilities of the students than in developing a personal relationship with them.

During the interviews, the teachers basically agreed with the descriptions of their teaching style. Most of the exceptions taken were minor in nature. One teacher agreed that she did give a lot of commands without explaining them, but noted that at the beginning of the year she had explained her procedures to her students. She had told them that she would sometimes give reasons for commands, but at other times she would merely expect the students to obey without any reasons given. In a sense, this was an explanation for all of the "unexplained" commands, but of course the procedure of giving many commands without explanation was still the end result.

The field-dependent teachers agreed to the "parental" metaphor in different ways. One agreed wholeheartedly and mentioned worrying about certain students over the weekend because of their problems.

The other field-dependent teacher was not certain about the parental role but said, "I do see school as an extension of the home if that's what you mean." The latter agreed that the personalities of the students, and the differences between them, was what made teaching so interesting.

As a contrast to the "school as an extension of the home" concept, none of the field-independent teachers gave such a definition for school. They all saw school as a place of learning, a place for students to develop self-discipline, to progress toward "self-actualization." One field-independent teacher said she had not thought about using the techniques described in her paper, but she recognized that this was how she taught. She commented, "I wasn't trained to do those things, I just developed them over the years." All of the field-independent teachers agreed that they gave reasons and encouraged reasoning to a great extent, and that they were most interested in how far their students had come by the end of the year.

The only serious criticism came from one field-dependent teacher who thought that some reference to "child-centered approach" and "individualized instruction" should have been in the description. "I am not the focus in my classroom," the teacher responded to emphasize the point. The researcher explained that since the teacher was not the focus it was more difficult for the researcher to draw these conclusions. If the researcher had been privy to all of the one-to-one dialogues between the teacher and a student, and

read all of the assignments the students had completed after the teacher had evaluated them, then the researcher could have drawn additional conclusions. The researcher concluded by explaining that the descriptions were based upon the public comments and actions of the teacher, and those one-to-one dialogues that the researcher was able to overhear. This teacher appeared to be satisfied with that explanation, and indicated an acceptance of the rest of the description.

Even though the teachers endorsed the descriptions of their teaching behavior, there was some defensiveness. Commenting upon one aspect of the description, a teacher said, "I don't think there's anything wrong with that." The researcher agreed with the teacher. The researcher had often told the teachers that this study was not concerned with evaluating teacher behavior, but with accurately describing their behavior. On that point, the teachers seemed to support the findings as presented to them.

Analysis of Field-Dependent-Independent Data

Two fourth and two fifth grade teachers and one sixth grade teacher from the same elementary school served as subjects for this study. On a possible scale of 0 to 18, their scores on the Group Embedded Figures Test were 0, 4, 14, 18, and 18. The first two scores were in the lower quartile and the last two in the upper quartile with regard to the strength of field-dependence-independence. The score of 14 only missed the upper quartile by one point. Both

the field-dependent teachers, one male and one female, were over 40 and had taught for more than 20 years. Of the field-independent teachers, two females and one male, two were over 40 and one was 38; two had taught over 20 years and one had taught for 14 years.

Instructional Procedures checklist

A chi-square statistic was computed on the tallies recorded for all major headings from the two checklists, and for the minor headings under Teacher as Nurturer. The chi-square formula used was taken from Popham and Sirotnik (1967):

$$\chi^2 = \frac{(|\text{observed} - \text{expected}| - 0.5)^2}{\text{expected}} + \frac{(|\text{observed} - \text{expected}| - 0.5)^2}{\text{expected}}$$

The numbers for the chi-square expected values were generated by computing two-fifths of the total tallies of all the teachers for the field-dependent teachers and three-fifths of the total tallies for the field-independent teachers. This procedure was followed because the researcher spent the same amount of time with each of the five teachers; therefore, the tallies were unequal due to the extra field-independent teacher. A 0.5 correction factor was also subtracted from each cell in the equation since there was only one degree of freedom. The tables that follow are based upon the frequency counts for the first phase of research, when each teacher was observed once a week for two hours.

Table 1. Summary of observed and expected frequencies from the Instructional Procedures checklist^a

Category	Field-Dependent	Field-Independent	χ^2
1. Directive	406 (302.8)	351 (454.2)	58.1**
2. Receptive, Supportive	238 (270.4)	438 (405.6)	6.3
3. Analytical, Logical	38 (98.0)	207 (147.0)	60.2**
4. Demanding, Sets Standards	58 (69.6)	116 (104.4)	3.0
5. Supplementary Experiences	53 (65.2)	110 (97.8)	3.5

^aExpected frequencies in parentheses.

** .001.

All four hypotheses were supported by the findings of this research. The chi-square results from the instructional procedures checklist support hypotheses one and three. Field-dependent teachers were more directive than field-independent teachers. Field-independent teachers were more analytical than field-dependent teachers. No differences were found for other major headings, but there were interesting contrasts between categories. Differences appeared to exist in the way field-dependent and field-independent teachers supported students in their learning activities. Field-independent teachers tended to challenge students and to use pictures or illustrations in their instruction. The data from the major headings are presented to illustrate the nature of these differences.

Field-Dependent		Field-Independent		
A	B	C	D	E
2	0	0	0	1
10	1	12	0	5
12	0	14	0	9
76	111	33	26	15
0	0	1	0	2
5	2	11	2	3
3	0	5	2	2
13	13	1	1	1
2	2	0	0	4
5	0	0	0	2
29	4	30	7	13
51	65	51	66	32
12	23	2	4	2
20	14	27	35	18
19	28	22	27	12
208	198	158	104	89

The Teacher Is Directive

1. Requires recall (rote memory).
2. Demonstrates (e.g. an experiment).
3. Lectures.
4. Commands students.
5. Has student reports.
6. Uses repetition.
7. Identifies objects (underlining nouns on the chalkboard).
8. Does work for a student.
9. Gives choices which are manipulative ("Should we finish our math now or skip the movie this afternoon and do it then?")
10. Reinforces racial/sexual stereotypes?
11. Has controlled discussions (asks leading questions).
12. Tells how
 - a. by revealing answers.
 - b. by explaining something.
 - c. by giving directions.

Total Tallies for Directive

The Teacher is Directive tallies indicate that field-dependent teachers were more directive primarily because of the Commands Students category. The Tells How by Revealing Answers and Does Work

for a Student categories also contributed to the directive findings for field-dependent teachers. Field-dependent teachers tended to work math problems for students, showing students how to do them, whereas field-independent teachers would ask probing questions to get students to come up with the answers. The researcher observed a field-dependent teacher taking a compass from a student to show him how to do the task and another field-dependent teacher looked up a word in the dictionary for a student. A field-dependent teacher rewrote the address on an envelope for a student who had several misspelled words on it.

Field-independent teachers were less likely to tell students what a right answer was than a field-dependent teacher. As an illustration, when students in the class of one field-independent teacher answered math questions with uncertainty, the teacher would typically respond, "Are you asking me or telling me?" The student would then repeat the answer in a more positive tone and the teacher said whether the response was correct. If it was not correct, the teacher had the student rework the problem and get the right answer before moving on. The students were never simply given the right answer.

In the interviews the field-dependent teachers stated that they did show students how to do tasks because they felt that many students learn better that way. This attitude is supported by the study Laosa (1978) conducted involving a mother teaching her child

to do a certain task. The field-dependent mothers were more likely to show their child how to do the task than the field-independent mothers. Pemberton (1952) concluded that field-dependent people were more concerned with "doing not theorizing." The findings that field-dependent teachers are more directive in Stone (1976a) and in this study could explain why the research on matched pairs has consistently found that field-dependent students perform better when matched with field-dependent teachers (Packer & Bain, 1978).

Contradictory findings have been reported for lecturing. Wu (1967) concluded that field-independent teachers preferred a lecture approach and Moore (1973) concluded that field-dependent teachers preferred lecture. The Tells How category could be considered a form of lecture along with the actual Lecture category, but there is no difference between field-dependent and field-independent teachers to report in either category.

Field-Dependent		Field-Independent			
A	B	C	D	E	
12	13	19	13	6	13. Accepts or encourages student's ideas.
11	20	68	71	61	14. Gives commands in the form of a question or request.
40	51	23	88	37	15. Works with an individual student.
35	33	6	9	1	16. Gives "strokes" (personal recognition to stimulate effort on task).
13	10	9	21	6	17. Gives praise
111	127	125	202	111	<u>Total Tallies for Receptive, Supportive</u>

The Teacher is Receptive, Supportive

The Teacher is Receptive, Supportive did not reach significance in the chi-square test, but there were some interesting differences among the items. Field-independent teachers tended to give commands in the form of a question or request instead of ordering students to do something. Field-dependent teachers were supportive to students in a more direct way, giving "strokes" to their students more often than field-independent teachers.

A sharp contrast between field-dependent and field-independent teachers concerned how they issued commands to students. Often field-dependent teachers simply gave an order like, "Turn to page . . .," but field-independent teachers tended to begin commands by saying, "Would you . . .," or "Why don't we . . .," or "Let's turn to page . . .," instead. This sort of diplomacy was reversed with regard to the Gives "Strokes" category. Field-dependent teachers were usually receptive to the student, taking some time to pay the student a personal compliment or to listen to a student who came up to share some item of personal interest during seat work time. Field-independent teachers typically gave perfunctory responses which did not constitute a "stroke," or discouraged the student by saying something like, "I don't want to hear about that right now."

A finding that emerged from the recoding of the data concerned how the teachers praised students. Each tally for praise was recoded to indicate whether teachers praised students for

cooperating on tasks and completing tasks, or for the quality of the work students completed.

Field-Dependent		Field-Independent		
A	B	C	D	E
13	10	9	21	6
5	2	8	20	5
8	8	1	1	1

17. Gives praise

- a. for the quality of the student's work.
- b. for completion of the task or for cooperation.

Although the numbers are not large, there was a tendency for field-dependent teachers to praise students for completing their assignments or for cooperation, whereas field-independent teachers praised students for the quality of their work. Both field-dependent teachers used stickers or stamps which they occasionally affixed to completed assignments. Field-independent teachers never did this. As a contrast, a field-independent teacher looked at a short story by a student and after reading it, made some comments and suggestions for improving it. Then the teacher praised one line that was especially well-written. Another field-independent teacher watched a creative skit three students performed for the class. When it was over the teacher singled out one student for praise because she had played her part so well.

Little research has been done specifically in this area, but the findings that field-dependent subjects were gregarious and other

oriented (MacKinnon, 1960) would complement the finding that field-dependent teachers were more likely to give "strokes" than field-independent teachers. There has been no research done on the kind of praise a teacher gives students, but two studies reported that field-dependent people were ambiguous in their evaluations of others (Gruenfeld & Arbuthnot, 1969; Weissenberg & Gruenfeld, 1966). This could indicate that field-dependent teachers would not be as concerned with differences in the quality of student work.

Field-Dependent		Field-Independent		
A	B	C	D	E
5	7	28	26	26
3	3	5	11	5
3	0	18	11	6
0	0	0	0	0
6	11	28	23	20
17	21	79	71	57

The Teacher is Analytical, Logical

19. Uses a problem solving approach.
20. Reminds students of the consequences for getting the work done (reward), or for failing to get it done (punishment).
21. Awakens anticipation ("What do you think the character will do?").
22. States the opposite of the truth (playing the devil's advocate).
23. Explains the reasons for a task or command.

Total Tallies for Analytical, Logical

The Teacher is Analytical, Logical was completely dominated by the field-independent teachers, in accordance with past personality research. Field-independent teachers tended to use a problem solving

approach when students came up to them for help, and they also served as models for reasoning by frequently giving reasons for the tasks they assigned or for the commands they gave. Field-independent teachers were more likely to prepare students for tasks to be assigned or to alert students to elements in a task that would be important later on.

Encouraging students to solve their own problems was a consistent approach used by field-independent teachers. Instead of giving students the answer or showing them how to resolve the problem, field-independent teachers would ask the students questions to direct their thinking toward a solution. Sometimes the questions were merely intended to force the student to review procedures, as in the following exchange from the field notes:

"What were you supposed to do first?" (Student answered.)
"And then?" (Student answered.) "And then?" (Student answered incorrectly.) "No." Teacher does not tell student what to do but turns to help another student.

Field-independent teachers tended to draw attention to events in a story being discussed or read aloud in class. They were much more likely to spend considerable time preparing students for such literary events or for tasks to be completed when students came back from recess or lunch. Field-independent teachers demonstrated logic not only by anticipating events and providing students with a framework for upcoming tasks, but also by providing a rationale for tasks or commands. A field-independent teacher told a student to

be quiet while others were reading the story aloud because, "I expect the others to listen when you read."

There is a considerable body of research to support the idea that field-independent teachers are more analytical than field-dependent teachers. Field-independent subjects have performed significantly better than field-dependent subjects on mathematics tests (Templer, 1973; Thornell, 1974). Field-independence has correlated highly with preferences for analytic or theoretical activities (Pemberton, 1952). Field-independent children have been more effective in developing and testing hypotheses to reach correct solutions to a problem (Shapson, 1976). Field-independent teachers had a high correlation with reasoning ability (Stone, 1976a) and demonstrated a preference for a question oriented approach to instruction (Moore, 1973). The present study reinforced the relationship established between field-independent teachers and analytic behavior, and supported the conclusion that field-independent teachers use a problem solving (question oriented) approach to instruction.

Field-Dependent		Field-Independent		
A	B	C	D	E
1	7	2	13	3
5	3	4	0	4
6	10	19	4	12
6	4	16	14	14
2	0	2	2	1
10	4	1	4	1
30	28	44	37	35

The Teacher Is Demanding, Sets Standards

24. Rejects or discourages student input.
25. Sets an example (imitation).
26. Asks for or accepts volunteers.
27. Puts the child on his mettle ("I want to see how well you can read today.")
28. Instructs in a racial/sexual bias free manner.
29. Uses threats or "fear" tactics.

Total Tallies for Demanding, Sets Standards

The Teacher is Demanding, Sets Standards had only one category that indicated a difference between field-dependent and field-independent teachers. Field-independent teachers tended to put the child on his mettle, which generally involved two types of events. After teachers asked questions, they occasionally called for a response from students who were not volunteering or who were inattentive. The other type of event concerned the teacher challenging students to improve their behavior because it was interfering with the instruction. A field-independent teacher conducting a group discussion told a student he should not talk when other students were talking and the student flippantly replied, "I know." The teacher replied, "If you know, show me!"

Words are cheap! You say you understand but you continue to engage in the same behavior. Excuse me, Jane, continue please."

Little research has been done on how demanding or challenging field-dependent or field-independent teachers are. A study by DiStefano (1969) found that field-independent teachers tended to be more critical of field-independent students regarding their mastery of certain skills. No other research has indicated differences in the standards set by field-dependent or field-independent teachers.

Field- Dependent		Field- Independent		
A	B	C	D	E
1	0	1	0	1
1	3	4	0	0
1	1	7	9	9
2	1	2	2	2
5	0	3	1	5
5	1	2	0	3
7	1	11	0	6
8	4	13	0	9
12	0	8	6	6
42	11	51	18	41

The Teacher Includes Supplementary Experiences

30. Dramatizes events.
31. Uses games.
32. Uses pictures, illustrations.
33. Uses humor.
34. Has students work in small groups.
35. Associates information in the material with something else.
36. Associates information with the teacher's experience (self disclosure).
37. Relates information to the child's experiences.
38. Has open group discussions (asks open-ended questions).

Total Tallies for Supplementary Experiences

The Teacher Includes Supplementary Experiences showed only one discernible difference between field-dependent and field-independent teachers. Although the numbers are low, field-independent teachers appeared to be more inclined to use pictures or illustrations from the texts to stimulate discussion than field-dependent teachers. Both field-dependent and field-independent teachers tended to show movies and not discuss them. Showing movies only received a tally if the teacher used them in his or her instruction. Field-independent teachers would note pictures in reading books or show the pictures in a library book to the students, or ask students to make their own illustrations.

This is another area where little research has been done in the classroom. Sousa-Poza, Rohrberg, and Shulman (1973) reported a greater tendency for self-disclosure from field-dependent subjects. No such difference was found between field-dependent and field-independent teachers in this category.

Instructional Interaction checklist

The same procedure for determining chi-square which was used for the Instructional Procedures checklist was repeated for the headings on the Instructional Interaction checklist. The values that were generated are presented in Table 2.

Table 2. Summary of observed and expected frequencies from the Instructional Interaction checklist^a

Category	Field-Dependent		Field-Independent		χ^2
1. Antagonist	13	(9.2)	10	(13.8)	2.0
2. Critic	138	(94.4)	98	(141.6)	32.7**
3. Nurturer	260	(219.6)	289	(329.4)	12.1**
A. Person	203	(116.4)	88	(174.6)	106.2**
B. Student	57	(103.2)	201	(154.8)	33.7**
4. Stranger	28	(24.0)	32	(36.0)	0.9
5. Manager	104	(128.0)	216	(192.0)	7.2*

^aExpected frequencies in parentheses.

* .01.

** .001.

The categories concerning warmth and positive physical contact with students were contained in the Teacher Nurtures the Student as a Person subheading. The results support hypotheses two and four. Field-dependent teachers engaged in more positive physical contact with students and exhibited more warmth than field-independent teachers. In contrast, field-independent teachers were more nurturant toward students in their academic efforts. Field-dependent teachers tended to use criticism of student behavior for classroom control, but field-independent teachers tended to rely on impersonal classroom management techniques. There were no differences

and little behavior recorded for the Teacher as Stranger heading nor for the Teacher as Antagonist heading. These categories will not be discussed, but the results are presented in Appendix E.

Field-Dependent		Field-Independent		
A	B	C	D	E
15	3	7	5	5
5	6	13	7	3
4	5	1	4	2
0	0	3	3	1
0	0	0	0	0
1	1	0	0	0
0	2	6	2	0
54	42	4	16	16
79	59	34	37	27

Teacher as Critic

The teacher responds to the students by:

6. giving a gentle reprimand.
7. giving a firm reprimand.
8. discouraging a student.
9. instilling guilt.
10. threatening to withdraw the teacher's affection.
11. referring student to a higher authority (principal, parent).
12. remaining silent ("Tom, I'm waiting for you.")
13. criticizing or accusing.

Total Tallies for Teacher as Critic

Teacher as Critic shows differences between field-dependent and field-independent teachers only in the category of criticizing or accusing students. Field-dependent teachers tended to make critical comments about student behavior. The criticisms usually related to infringements of the rules and regulations of the classroom. As an interesting example of this concern, a field-dependent teacher went over to a student at her desk in response to her request that

the teacher read the report she had written. The teacher read it and made some critical comments. The student began to get up from her seat while the teacher was talking, presumably to go to the Instructional Media Center to work on the report. The teacher said, "Now you sit down . . . use the manners you were taught at home . . . I told your father about that (at a recent parent-teacher conference)." The criticism here quickly turned from the work of the student to her behavior.

Jackson (1968) noted that elementary teachers generally criticized students for breaking rules. That finding, along with the finding that field-dependent people are more concerned with order (Campus, 1974), could explain the results in this category. DiStefano (1969) also reported that field-dependent teachers tended to be critical of their field-dependent students with regard to sociability rather than their academic work. Other research has reported no differences between field-dependent and field-independent teachers regarding the amount of criticism they gave (Ohnmacht, 1968).

Field-Dependent		Field-Independent		
A	B	C	D	E
113	85	28	42	18
40	23	11	12	4
29	16	1	6	11
8	0	0	0	0
1	0	2	1	1
0	2	2	0	2
40	44	12	23	0
34	18	12	21	0
26	11	10	17	0
8	12	2	6	0
6	26	0	2	0

31	26	103	57	41
8	2	17	17	2
13	3	26	18	5
5	3	7	8	1
1	3	4	1	1
1	4	21	9	14
3	11	28	4	18
145	111	131	99	59

Teacher as Nurturer

The teacher supports the student as a person.

14. being friendly and familiar with the child.

15. joking, teasing, being humorous.

16. calling a student by an affectionate name or nickname (honey, dear).

17. defending a child against other students.

18. not punishing incorrect answers or poor performances.

19. engaging in physical contact with students.

a. touching students

1.) supportive

2.) disciplinary

b. allowing students to touch him or her.

The teacher supports the student as a learner.

20. enjoying a correct response.

21. encouraging a student.

22. being eager, enthusiastic about the student's work.

23. accepting blame, admitting mistakes.

24. encouraging peer group control or interaction.

25. using "we" to refer to she or he or class.

GRAND TOTAL Tallies for Teacher as Nurturer

Teacher as Nurturer was related to field-dependent teachers when considering the total tallies, but looking at the categories more closely reveals another difference. The field-dependent teachers engaged in behavior which supported the student as a person, whereas the field-independent teachers engaged in behavior which supported the student as a learner. These findings illustrate the way hypotheses can emerge from the data in ethnographic research. The researcher had hypothesized that field-dependent teachers would be more likely to exhibit nurturing behavior toward students, specifically by being warm and friendly with students, or joking, teasing, and being humorous with students. It was not anticipated that field-independent teachers would be more nurturant than field-dependent teachers regarding their support for the student as a learner. The data indicated that field-independent teachers tended to affirm correct responses, encourage students to help each other, and promote the notion of a group responsibility for learning more than field-dependent teachers.

Field-independent teachers would be friendly and familiar with students before class, or at noon, or after school, but the field-dependent teachers tended to be friendly with students consistently throughout the school day. Students came up to field-dependent teachers at any time to talk about things that were of personal interest to them. These topics included such things as who was going to win the Super Bowl, something new their parents

had just bought, a trip they were going to take, or a quarrel they were having with a friend. Field-independent teachers would listen to these personal statements at times, but often they would interrupt the students by asking if they had completed the assignment yet and urging them to do that. The following excerpt from the field notes is an illustration of the emphasis field-independent teachers placed on the task at hand.

"Do you know how the Palestinian Liberation Army gets their tanks?" (Student is walking toward the teacher.) "Is this a joke or what?" "No, well . . ." "Oh, OK, No, I don't know." "Well, they (convert caterpillars and bulldozers) into tanks." "Where did you read that, in the paper?" "No . . ." "In a book or a magazine or something?" "Yeah (names the magazine)." Teacher puts hand on the student's shoulder and steers him back to his desk, walking with him. "Did you have a question, Steve?" "No." "OK." (Student sits in desk, teacher moves on).

Another difference between teachers related to the idea of being warm and friendly was their perception of appropriate behavior in the classroom. Field-dependent teachers permitted their students to do more socializing than field-independent teachers. This difference can be seen in the contrast between two incidents. A field-dependent teacher called out to a cluster of girls who were talking during seat work time, "Girls, make sure you get your work done before you have your group session." A field-independent teacher was telling students that they would probably have to have a seating chart and asked for their suggestions about how the seating should be arranged. One girl suggested that they should sit next to someone who was not their best friend but whom

they wanted to get to know better. The teacher replied, "We have very different ideas about school." Field-dependent teachers were much more likely to say nothing to students who quietly socialized after finishing their assignments, but field-independent teachers tended to ask the students to do something. Usually field-independent teachers would suggest that students read library books during their free time.

Field-dependent teachers would joke with students and tease them at different times throughout the day, but field-independent teachers would generally reserve this kind of interaction for before or after school, or when the students were leaving or returning from recess. Field-dependent teachers also touched students and were touched by students more than field-independent teachers. This was not apparent at first because one field-independent teacher did quite a bit of touching. This teacher touched in a deliberate, conscious manner, usually to reinforce praise or a reprimand. Students did not come up to touch this field-independent teacher the way they did with the field-dependent teachers.

Field-dependent teachers seemed to touch students spontaneously, without thinking about it, and one field-dependent teacher encouraged students to "get hugs" if any student felt he or she needed one. As a contrast, one field-independent teacher never touched students, and another seldom touched students. The latter teacher believed that touching students was important, but admitted that it was not something she would do automatically.

The nurturing behavior from field-independent teachers was much more likely to be related to student work. Field-independent teachers frequently gave students encouragement and would respond to correct answers consistently by saying "good," or "that's right!" The field-independent teachers, in particular the two females, also used the idea of the group and the responsibility of the individual to contribute to the group as both a classroom management technique and as a gesture of support for the students in their learning. The male field-independent teacher stated that he consciously avoided using "we" or using the group as a management technique because he wanted students to develop self-discipline for their own needs but not as a response to others.

As an example of using the group to support the students as learners, one field-independent teacher often taught the math lesson by putting an example of a problem on the chalkboard and asking a student to come up and solve it while the other students solved it at their desks. When the student at the chalkboard had finished, the teacher would turn to the class and say, "Is he (she) right?" The class would respond yes or no in chorus. Field-independent teachers also encouraged student interaction as a means of enhancing the learning experience. The following example from the field notes illustrates this point:

Another student comes up and says he's "D-U-N done!" Teacher says, "How come there's two left if you're finished?" He says he doesn't know how to do them, refers to the numbers of the problems. Teacher says we'd better find out and the boy at the (nearby) desk says those problems are like the one on the back of the sheet. Teacher says, "Show him." He points out that other problem and explains it.

The researcher hypothesized that the field-dependent teachers would exhibit more warmth toward their students based upon personality research. Campus (1974) reported a significant relationship between field-dependence and nurturance. The findings for extraversion (Sell & Duckworth, 1974) and greater interpersonal dependence (Alexander & Gudeman, 1965) for field-dependent subjects suggested that field-dependent teachers would tend to be friendly and familiar with students. Field-dependent children have demonstrated a greater reliance on adults (Crandall & Sinkeldam, 1964) and MacKinnon (1960) reported a relationship between field-dependence and gregariousness.

The research consistently reports a tendency for field-dependent people to be other-oriented, socially outgoing, which supports the idea of field-dependent teachers being more nurturant than field-independent teachers. One study suggested that field-independent teachers might tend to be nurturant toward the student as a learner. Dreyer (1975) observed parents and children in a laboratory problem solving task. He found that parents of field-independent children tended to verbally approve of the contributions their children made to resolving the problem.

Field-Dependent		Field-Independent		
A	B	C	D	E
1	1	7	3	1
2	0	3	5	0
5	3	14	14	8
7	8	24	18	14
7	3	8	7	6
4	7	14	7	12
7	26	5	15	6
2	13	2	12	4
1	3	0	0	1
4	0	3	0	2
40	64	81	81	54

Teacher As Manager

The teacher responds to the students by:

32. calling on students who have their hands raised.
33. reacting to nonverbal cues other than hand raising.
34. calling for a sense of propriety.
35. exhorting students ("I can't hear any of you, let one person talk.").
36. giving warnings regarding future conduct ("When the sixth grade comes in we should all sit very still and be quiet.").
37. giving an impersonal response ("We're waiting for some of you to finish.").
38. using meaningful gestures (snaps fingers, points).
39. using meaningful facial expressions (includes staring at a student).
40. giving designated punishments (writing something fifty times).
41. excluding student from others.

Total Tallies for Teacher As Manager

Teacher as Manager contained categories that were related to the way teachers administrated the rules and regulations of their classrooms. This could take a variety of forms, but usually involved an impersonal, managerial role on the part of the teacher. Teachers exhorted students, "Focus on your work," and sometimes used aphorisms

to make the point. "You can't make progress without taking steps." Field-independent teachers tended to enforce their procedural guidelines more than field-dependent teachers who would be more easily distracted by talking with an individual student, with an aide, or with some other classroom visitor. The main technique field-independent teachers used, other than exhorting students, was to call for a sense of propriety, "Bill, that's inappropriate. I think you'd better reassess."

Witkin et al. (1977b) cited research showing that field-independent people tend to be more aloof than field-dependent people. This could account for the ease with which field-independent teachers assumed a more impersonal, managerial role. Two studies found that field-independent people tended to perceive themselves as being in control of their lives (Chance & Goldstein, 1971; Suzman, 1973). This might also contribute to the choice of field-independent teachers to use more impersonal techniques to control his or her class rather than relying on a close, personal relationship as a basis for expecting cooperation from students. The latter approach provides students with a measure of control which is not possible with the more impersonal approach.

A Comparison of Teacher Behavior
During the First and Second Phases of Research

To compare the behavior of the teachers during the first and second phases of the research, the total number of tallies for each heading were used. The tallies for the first phase were divided by fourteen and the tallies for the second phase were divided by ten. These divisors represented the number of hours each teacher was observed during each phase of the research. The tallies/hour figures were then compared for the field-dependent teacher who participated in both phases of the research. The tallies/hour figures for the field-independent teachers were divided by three to yield the average tallies/hour for the three teachers, and these averages were compared.

In Tables 3, 4, 5, and 6, the figures given for the first phase represent the behavior of the teachers as observed for two hours once a week for seven weeks, teaching the same subjects at the same time of the day. The figures for the second phase represent the behavior of the teachers as observed during part or all of four consecutive days, teaching all subjects. This comparison is important to discover whether the teachers maintained their teaching style across subject matters and throughout the day. In presenting the comparison, the tallies/hour for all major headings are presented as well as certain selected categories. Categories were

included if they had a substantial number of tallies which made a major contribution to the total tallies recorded for the heading.

Table 3. Tallies per hour from the Instructional Procedures checklist for the field-dependent teacher.

Major Headings Tallies/Hour		Categories Tallies/Hour		Instructional Procedures
1st Phase	2nd Phase	1st Phase	2nd Phase	
14.1	13.7			The Teacher is Directive
		7.9	7.3	4. commands students
		4.6	5.0	12. tells how.
9.1	7.9			The Teacher is Receptive, Supportive
		3.6	3.6	15. works with an individual student.
		2.4	1.5	16. gives "strokes" (praise for personal qualities).
1.5	1.6			The Teacher is Analytical, Logical
2.0	2.0			The Teacher is Demanding, Sets Standards
0.8	0.1			The Teacher is Being Creative

Table 4. Tallies per hour from the Instructional Interaction checklist for the field-dependent teacher.

Major Headings Tallies/Hour		Categories Tallies/Hour		Instructional Interaction
1st Phase	2nd Phase	1st Phase	2nd Phase	
0.4	0.4			Teacher As Antagonist
5.6	5.9			Teacher As Critic
		3.9	3.8	13. criticizing or accusing.
7.9	4.6			Teacher As Nurturer
6.1	2.6			Teacher Supports the Student as a Person.
		1.6	.5	14. being friendly & familiar with the child.
		2.1	0.2	15. joking, teasing, being humorous.
		3.1	1.9	19. engaging in physical contact with students.
		1.2	1.5	a. touching students.
		1.9	0.4	b. allowing students to touch him or her.
1.9	0.2			Teacher Supports the Student as a Learner.
1.4	1.2			Teacher as Stranger
4.6	3.9			Teacher as Manager
		1.9	1.4	38. using meaningful gestures (snaps fingers, points).
		0.9	0.7	39. using meaningful facial expressions (includes staring at a student).

Tables 3 and 4 reflect the consistency of behavior regarding instructional procedures and instructional interaction for the field-dependent teacher who remained in the research after February. The only change of any importance for the field-dependent teacher concerned instructional interaction in the Teacher as Nurturer heading. A small change occurred in the Receptive, Supportive heading. The same reason stimulated the change in both areas. The field-dependent teacher began to have discipline problems during the one week observation period that took place toward the end of April. Whether it was because the end of the school year was drawing near or that spring had finally, if reluctantly, appeared following a long winter or for other reasons can only be a matter of speculation. The point is that the class was not behaving well. The teacher responded by becoming less friendly with the students, rarely joking with them, and they responded by not coming up to touch the teacher as often as they had in the past.

This accounts not only for the large change in the tallies for nurturing behavior but for the change in the Receptive, Supportive heading as well. The main reason for a change in the latter heading can be attributed to the Givens "Strokes" category. During the "troubled time" the teacher did not indulge in as many personal dialogues with students and for the first time during the research even rejected attempts by students to engage the teacher in such a dialogue.

Table 5. Mean tallies per hour from the Instructional Procedures checklist for field-independent teachers.

Major Headings Tallies/Hour		Categories Tallies/Hour		Instructional Procedures
1st Phase	2nd Phase	1st Phase	2nd Phase	
8.4	10.2			The Teacher Is Directive
		2.5	2.3	4. commands students.
		1.2	1.5	11. has controlled discussions (asks leading questions).
		3.6	4.6	12. tells how.
10.4	7.8			The Teacher Is Receptive, Supportive
		4.8	4.1	14. gives commands in the form of a question or request.
		3.5	2.0	15. works with an individual student.
		0.9	0.6	17. gives praise.
4.9	3.5			The Teacher Is Analytical, Logical
		1.9	1.3	19. uses a problem solving approach.
		0.8	0.5	21. awakens anticipation ("What do you think the character will do?")
		1.7	1.4	23. explains the reasons for a task or command.
2.8	2.2			The Teacher is Demanding, Sets Standards
		1.0	0.8	27. puts the child on his mettle ("Now let's see how well you can read today.")
2.6	2.5			The Teacher Includes Supplementary Experiences

Table 6. Mean tallies per hour from the Instructional Interaction checklist for field-independent teachers.

Major Headings Tallies/Hour		Categories Tallies/Hour		Instructional Interaction
1st Phase	2nd Phase	1st Phase	2nd Phase	
0.2	0.2			Teacher as Antagonist
2.3	2.0			Teacher as Critic
6.9	5.8			Teacher as Nurturer
2.1	1.8			Teacher Supports the Student as a Person.
		0.8	0.5	19. engaging in physical contact with students.
4.8	3.9			Teacher Supports the Student as a Learner.
		0.9	1.3	20. enjoying a correct response.
		1.2	0.6	21. encouraging a student.
		1.0	0.6	24. encouraging peer group control or interaction.
		1.2	1.1	25. using "we" to refer to she or he and the class.
0.8	0.4			Teacher as Stranger
5.1	3.5			Teacher as Manager
		0.9	0.6	34. calling for a sense of propriety.
		1.3	1.1	35. exhorting students.

In Tables 5 and 6, the tallies for the field-independent teachers were lower during the second phase of the research for several headings: Directive; Receptive, Supportive; Analytical, Logical; Nurturer; and Manager. The differences in most of these areas are not large, and they are primarily due to the same cause. A theme in all of the classrooms of field-independent teachers was self-responsibility. Much of the interaction between teachers and students, such as exhorting the students or calling for a sense of propriety, emphasized the importance of self-responsibility and self-discipline. The focus of field-independent teachers on nurturing students as learners was directed toward the ultimate purpose of encouraging the students to take responsibility for their learning, to motivate themselves, to persevere, with the reward being success in their school work. As one field-independent teacher said during the final interview, his goal for all students was to stimulate them to progress toward self-actualization.

By the time the researcher began to make the observations for the second phase of the research he noted that the students were working more independently, relying less on the advice of the teacher. Field-independent teachers had rarely answered questions students asked but usually asked questions of students to steer their thinking in the direction of the answer. Perhaps for this reason students appeared to ask the teachers fewer questions during the second phase of the research. Since there were fewer questions, there were

fewer opportunities for the teachers to engage in problem solving behavior and fewer incidents involving the teacher working with an individual student. As students began to work more independently, the teachers did not have as much opportunity to respond with encouraging comments. Students working independently meant less movement in the classrooms so that field-independent teachers did not have to be a manager of the classroom as often as before.

This accounts for most of the behavioral differences, but one other factor contributed to the differences. By March and April all of the teachers were aware of how little time was left and how much was to be done before the end of the school year. Several teachers commented upon this fact in talking to their students. This might have been a factor in the field-independent teachers becoming more directive during this phase of the research. With the end of the school year fast approaching, the field-independent teachers began to explain more things to students rather than asking students to "figure it out" for themselves. This would also contribute to the lower tallies for the "Analytical, Logical" heading. Overall, the differences in behavior were not large, but appear to be consistent with the behaviors in the first phase.

Analysis of Male-Female Data

In looking at the field-dependent-independent data, the researcher noted some patterns that reflected a male-female dichotomy as opposed to the field-dependent-independent one. In order to explore

this difference more fully, the researcher organized the data according to sex, and computed chi-square statistics for each heading. The results appear in Tables 7 and 8.

Table 7. Summary of observed and expected frequencies by sex from the Instructional Procedures checklist^a

Category	Male	Female	χ^2
1. Directive	302 (302.8)	446 (454.2)	0.001
2. Receptive, Supportive	329 (270.4)	347 (405.6)	20.8**
3. Analytical, Logical	92 (98.0)	153 (147.0)	0.5
4. Demanding, Setting Standards	65 (69.6)	109 (104.4)	0.4
5. Supplementary Experiences	29 (65.2)	134 (97.8)	32.6**

^aExpected frequencies in parentheses.

** .001.

Table 8. Summary of observed and expected frequencies by sex from the Instructional Interaction checklist^a

Category	Male	Female	χ^2
1. Antagonist	9 (9.2)	14 (13.8)	0.02
2. Critic	96 (94.4)	140 (141.6)	0.02
3. Nurturer	210 (219.6)	339 (329.4)	0.6
A. person	127 (116.4)	164 (174.6)	1.5
B. student	83 (103.2)	175 (154.8)	6.3
4. Stranger	25 (24.0)	35 (36.0)	0.02
5. Manager	145 (128.0)	175 (192.0)	3.5

^aExpected frequencies in parentheses.

* .01.

The male teachers were more supportive primarily because of the Working with Individual Students category. The female teachers provided more supplementary experiences because they tended to work with the class as a whole more often than the male teachers. This contrast was the main factor contributing to the other differences found in the male-female data.

The Teacher is Directive heading contained some contrasts in individual categories, so it is included in the discussion. The other

headings which did not have significant differences also had no differences in particular categories either. These headings are not discussed, but the data is provided in Appendix F.

Male		Female		
A	B	C	D	E
1	0	10	12	5
0	0	12	14	9
4	7	29	30	13
198	104	208	158	89

The Teacher Is Directive

2. demonstrates (e.g. an experiment).
3. lectures.
11. has controlled discussions (asks leading questions).

Total Tallies for Directive

The Teacher Is Receptive, Supportive

13	13	12	19	6
20	71	11	68	61
51	88	40	23	37
33	9	35	6	1
10	21	13	9	6
2	20	5	8	5
8	1	8	1	1
127	202	111	125	111

13. accepts or encourages student's ideas.
14. gives commands in the form of a question or request.
15. works with an individual student.
16. gives "strokes" (personal communication to stimulate effort on task).
17. gives praise
 - a. for the quality of the student's work
 - b. for completion of the task or for cooperation.

Total Tallies for Receptive, Supportive

The Teacher is Directive heading did not reach significance in the chi-square test, but there was an interesting contrast in the tallies for three categories. It is clear from the tallies that female teachers

demonstrated, lectured, and had controlled discussions more than the male teachers. These results stemmed from the preferences of the female teachers for instructing the class as a group rather than working with individual students.

The Teacher is Receptive, Supportive achieved significance in the chi-square test because of the difference in the Works with an Individual Student category. This was a dominant classroom approach for both male teachers who tended to use worksheets, creative assignments, and a variety of other seat work activities.

Male		Female		
A	B	C	D	E
0	0	1	1	1
3	0	1	4	0
1	9	1	7	9
1	2	2	2	2
0	1	5	3	5
1	0	5	2	3
1	0	7	11	6
4	0	8	13	9
0	6	12	8	6
11	18	42	51	41

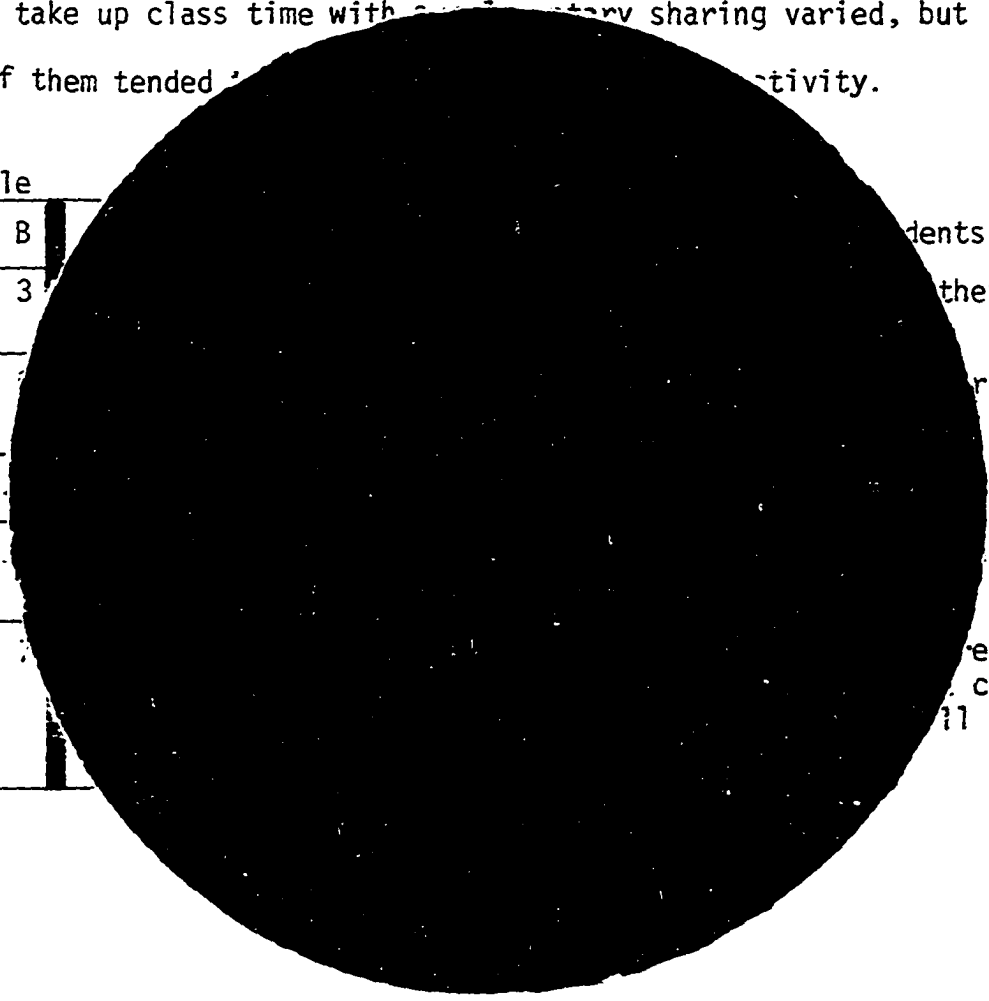
The Teacher Includes Supplementary Experiences

30. dramatizes events.
31. uses games.
32. uses pictures, illustrations.
33. uses humor.
34. has students work in small groups.
35. associates information in the material with something else.
36. associates information with the teacher's experience (self disclosure).
37. relates information to the child's experience.
38. has open group discussions (asks open-ended questions).

Total Tallies for Supplementary Experiences

The Teacher Includes Supplementary Experiences heading indicated some differences in the way males and females taught. Female teachers were more likely to engage the group in discussions which would include some open-ended questions. In such discussions, female teachers would relate aspects of what was being discussed to the children in a direct, personal way. When open-ended questions were asked, students were encouraged to give their opinions or share their personal experiences related to the topic. In return, the female teachers would share incidents from their past experience. As a contrast, the male teachers almost never talked about themselves or their personal experiences. The extent to which female teachers would take up class time with supplementary sharing varied, but all of them tended to encourage student activity.

Male	
A	B
1	3
0	
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3	



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The Teacher Includes Supplementary Experiences heading indicated some differences in the way males and females taught. Female teachers were more likely to engage the group in discussions which would include some open-ended questions. In such discussions, female teachers would relate aspects of what was being discussed to the children in a direct, personal way. When open-ended questions were asked, students were encouraged to give their opinions or share their personal experiences related to the topic. In return, the female teachers would share incidents from their past experience. As a contrast, the male teachers almost never talked about themselves or their personal experiences. The extent to which female teachers would take up class time with supplementary sharing varied, but all of them tended to spend time on this sort of activity.

Male		Female		
A	B	C	D	E
1	3	1	7	1
0	5	2	3	0
3	14	5	15	8
8	18	7	24	14
3	7	7	8	6

Teacher as Manager

The teacher responds to the students by:

32. calling on students who have their hands raised.
33. reacting to nonverbal cues other than hand raising.
34. calling for a sense of propriety.
35. exhorting students ("I can't hear any of you, let one person talk.").
36. giving warnings regarding future conduct ("When the sixth grade comes in we should all sit very still and be quiet").

Male		Female		
A	B	C	D	E
7	7	4	14	12
26	15	7	5	6
13	12	2	2	4
3	0	1	0	1
0	0	4	3	2
64	81	40	81	54

Teacher as Manager (Continued)

The teacher responds to the students by:

37. giving an impersonal response ("We're waiting for some of you to finish").
38. using meaningful gestures (snaps fingers, points).
39. using meaningful facial expressions (includes staring at a student).
40. giving designated punishments (writing something fifty times).
41. excluding student from others.

Total Tallies for Teacher as Manager

The Teacher as Manager heading showed that the male teachers tended to engage in more nonverbal disciplinary behavior than females. The two categories which contributed to the difference in this area were Using Meaningful Gestures and Using Meaningful Facial Expressions. The male teachers pointed, nodded, stared, snapped their fingers, and used other nonverbal techniques as a means of enforcing their procedural guidelines. This result was also related to the fact that the male teachers had their students doing more seat work and less group work than the female teachers. Seat work seemed to always call for more management behavior from all of the teachers; nevertheless, the management behavior of female teachers tended to be verbal in contrast to the many nonverbal techniques used by male teachers.

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Summary

The purpose of this study was to investigate what effect field-dependence-independence had on the behavior of teachers in their classrooms. The subjects for this study were selected from 17 teachers at three Ames elementary schools. These teachers were given the Group Embedded Figures Test as a measure of the strength of their field-dependence-independence. The researcher wanted to control for five variables: sex, years of teaching experience, grade level, strength of field-dependence-independence, and school setting. Five teachers from one elementary school were selected. The researcher utilized a participant-observer approach in the research, visiting the classrooms of each teacher for two hours once a week for seven weeks during the first phase of research. During the second phase of research the participant-observer visited the classrooms of each teacher for four consecutive days, two full days and two partial days. After the observations the researcher coded teacher behavior as recorded in his field notes by using checklists for instructional procedures and instructional interaction.

In ethnographic research the researcher often goes into the field with a framework to interpret the phenomena to be observed, but not necessarily formulating hypotheses. Hypotheses are allowed to emerge from the data as it is gathered. Because of the past research on personality and on teacher behavior as associated with field-dependence-

independence, the researcher formed four hypotheses before entering the classrooms to do the research. Other hypotheses did emerge from the data and are reported in the discussion section. The predetermined hypotheses were as follows:

1. Field-dependent teachers will exhibit more direct teacher behavior than field-independent teachers.
2. Field-dependent teachers will engage in positive physical contact with students more than field-independent teachers.
3. Field-independent teachers will be more analytical than field-dependent teachers.
4. Field-dependent teachers will exhibit more warmth for students than field-independent teachers.

Discussion

The results of this study lend further credibility to the hypotheses based upon past field-dependence-independence research regarding personality and teacher behavior. Using a chi-square test, all four hypotheses were supported. Field-dependent teachers were more direct than field-independent teachers, giving commands, revealing answers, and doing work for students. The second hypothesis also received support, with field-dependent teachers touching students more than field-independent teachers. A related finding was that field-dependent teachers were touched by students more than field-independent teachers were.

Field-independent teachers tended to be more analytical than field-dependent teachers, demonstrating and encouraging problem solving behavior in their classrooms. Field-independent teachers

gave reasons for tasks or for their commands, and would prepare students for coming events more consistently than field-dependent teachers. An additional factor related to this hypothesis which could not appear on the checklists was that all field-independent teachers taught science for their respective grade levels. The teachers essentially taught all subjects in their classrooms, but science was one subject certain teachers agreed to teach to all students in their particular grade level. The fact that all three field-independent teachers taught the science lessons supports past research that related field-independence to a preference for science (Witkin et al. 1977a).

The field-dependent teachers exhibited more warmth toward their students, warmth being defined by the categories under the first section of the Teacher as Nurturer heading. The significant categories included the teacher being friendly and familiar with students, joking with them, teasing them, and engaging in physical contact with them.

The chi-square test suggested other hypotheses as well. Field-dependent teachers tended to be more critical than field-independent teachers. Field-independent teachers tended to be more involved with classroom management and more supportive of their students as learners than field-dependent teachers.

The findings supporting the directive hypothesis indicated that field-dependent teachers tended to command students. Field-independent teachers on the other hand tended to give commands in the form of a question or request. Field-independent teachers also tended to offer

reasons why students should comply with commands or tasks. These findings have no foundation in previous research.

Field-dependent teachers tended to reveal answers and do tasks for students to show them how to do them. This finding supported Laosa (1978) who observed mothers teaching their children and found that field-dependent mothers tended to show their children how to do the task.

Field-dependent teachers tended to give "strokes" (personal attention) to students to support them in their efforts on assignments. They also tended to praise students for completing a task or for cooperation on a task, but field-independent teachers were more likely to give praise for the quality of the work. These findings are related to previous research by Weissenberg and Gruenfeld (1966) who found that field-dependent supervisors were ambiguous in their judgments of workers, and more specifically by Gruenfeld and Arbuthnot (1969) who reported that field-dependent people are more likely to be unable to distinguish between traits and performances of others. These findings would indicate that field-dependent teachers may tend to have lower expectations for students and perhaps are more easily satisfied with the work of students.

As much previous research had predicted, field-independent teachers were more analytical than field-dependent teachers, emphasizing the use of reason was a dominant theme in their classrooms. These teachers were concerned with what students thought rather than

how they felt. These teachers tended to give reasons for tasks and commands, and they demanded that their students use reason to work out problems. Field-independent teachers rarely gave answers or showed students how to do something. These findings supported the conclusions of Linn (1978) and Shapson (1976) who found that field-independent subjects were more effective at problem solving because they considered all possibilities.

The findings also indicated that field-independent teachers tended to challenge students. Field-dependent teachers tended to call on children who volunteered answers, but field-independent teachers would call on students who were inattentive or quiet to see if they understood the material under discussion. Previous research has not investigated this area.

Field-dependent teachers appeared to be more critical of the behavior of students than field-independent teachers. In contrast, field-independent teachers were impersonal or utilized positive techniques to enforce classroom procedures. Where field-dependent teachers criticized or accused students, field-independent teachers exhorted students or called for a sense of propriety. This finding not only has no corollary in previous research, but has been investigated by Ohnmacht (1967) who reported no difference between field-dependent and field-independent teachers.

Field-dependent teachers engaged in nurturing behavior more often than field-independent teachers by being friendly and

familiar with students, joking, teasing, and touching students or being touched by them. This finding is supported by considerable personality research which has described field-dependent people as other-oriented, extraverted, gregarious, and dependent on others. A related finding was that field-independent teachers were more nurturant than field-dependent teachers with regard to supporting the student as a learner. The field-independent teachers consistently affirmed correct responses students made, encouraged students to do their best, and encouraged meaningful interaction between students on learning activities. Field-independent teachers appeared to try to create a community of learners in their classrooms, and they supported behavior that reinforced that impression.

The data also revealed contrasts that appeared to be related to sex of the teacher rather than the cognitive style of the teacher. Male teachers tended to work with individual students doing seat work to a greater extent than female teachers. Female teachers spent more time doing large group instruction with the class as a whole.

Female teachers encouraged more discussion, asked more open-ended questions and encouraged more students to give their opinions. The female teachers would relate other information to the material under discussion, and they would also relate the material in some direct way to the experiences of the children. Female teachers would share their past experiences in these group discussions, but the male teachers

almost never engaged in self-disclosure. Since they engaged in more group work, female teachers were more verbal in their discipline. Male teachers frequently had their students working at their desks, and they engaged in nonverbal behavior to enforce the guidelines for their classes.

Recommendations

The four hypotheses were confirmed by the results, adding credibility to their value as variables for further study. Field-dependent teachers were more directive, more touch oriented, and exhibited more warmth than field-independent teachers. Field-independent teachers were more analytical than field-dependent teachers, emphasizing the use of reason in their classrooms and encouraging students to use reason. In addition to these hypotheses, other findings suggested directions for further research.

The areas that seemed to suggest the most possibilities involved such contrasts as field-dependent teachers commanding students and showing them how to do tasks, and field-independent teachers giving more reasons for commands and asking students to approach problems logically to derive solutions. Another interesting contrast involved the difference in the way teachers nurtured students. Field-dependent teachers nurtured students in a personal way, and field-independent teachers nurtured students by supporting their progress as learners. Another contrast was the tendency for field-dependent teachers to criticize the behavior of their students, whereas field-independent teachers used impersonal means for classroom control.

A final area that could prove to be valuable for further research is the way teachers choose to be receptive and supportive toward the efforts of their students to learn. The "strokes" given by field-dependent teachers involved personal attention to the qualities or interests of their students in order to encourage continued effort on the task. These "strokes" also reinforced the impression that field-dependent teachers took a parental role in their classrooms, whereas the tendency of field-independent teachers to ask students to do things rather than telling them reinforced the impression that field-independent teachers treated their students on a more adult level. Since the teachers themselves accepted this perception of the kind of role they played in their classrooms, this area would seem to merit further research as well.

The researcher also would suggest some specific recommendations to other researchers interested in doing participant-observation research in the classroom. It is important to establish a participant role as quickly and as clearly as possible. One way would be to establish some guidelines about doing some work for the teacher every day. This researcher had told the teachers in the study to ask him to do things for them, but some of them felt uncomfortable about interrupting the researcher in his note taking. This created a problem to a certain extent because the researcher did not fulfill his promise of giving the teachers some help.

Helping the teachers is important because it is a way of giving teachers an immediate benefit from their involvement in the

research, and if regular periods are set aside for helping teachers, it will not interfere with the data collecting. This researcher found participant-observation research to be a stimulating and valuable approach to educational research. It should be utilized in a manner that maximizes the advantages for both teachers and researchers.

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APPENDIX A: EXCERPTS FROM A CROSS-CULTURAL OUTLINE OF EDUCATION

II. How is the information communicated (teaching methods)?

1. By imitation
2. By setting an example
3. By instruction in schools, ceremonials, or other formal institutions
4. By use of punishments
5. By use of rewards
6. Problem-solving
7. Guided recall
8. Giving the child tasks to perform beyond his immediate capacity
 - (a) Jamming the machine
9. Mechanical devices
10. By kinaesthetic association
11. By experiment
 - (a) By teacher
 - (b) By pupil
12. By doing
13. By symbolic association
14. By dramatization
15. By games or other play
16. By threats
 - (a) By trials
17. By irrelevant association
18. By relevant association
19. Through art
 - (a) Graphic
 - (b) Music, general
 - (c) Songs
 - (d) Literature (stories, myths, tales, etc.)
20. By stating the opposite of the truth; writing antonyms
21. By holding up adult ideals
22. Acting in undifferentiated unison
23. Physical force
24. By positive or negative assertion
25. Repetition
26. By specifically relating information to the child's own body, bodily function or experience
27. Through ego-inflation
 - (a) Through ego-deflation
28. Through use of humour
29. By telling
30. By watching
31. By listening
32. Question and answer
 - (a) Teacher question, pupil answer
 - (b) Pupil question, teacher answer
33. Holding up class, ethnic, national, or religious ideals
34. By doing something on his own

35. By repeating the child's error to him
 - (a) By repeating the child's correct answer
36. By accusing
37. By following a model
 - (a) Human
 - (b) Non-human
38. By comparison
39. By filling in a missing part
40. By associative naming
41. By identifying an object
42. By group discussion
 - (a) By class discussion
43. Physical manipulation
 - (a) Bodily manipulation
 - (b) Bodily mutilation and other physical stresses
44. Rote memory
45. By working together with a student
46. Through special exhibits
47. By having children read substantive materials
48. By putting the child on his mettle
49. Through group projects
50. By giving procedural instructions
51. By demanding proof
52. Through reports by students
53. By pairing
54. By asking for volunteers
55. Through isolating the subject

V. How does the educator participate (teacher attitude)?

1. Eagerly
 - (a) Facial expression
 - (b) Bodily movement
 - (c) Tone of voice
 - (d) Heightened bodily tonus
2. Bored, uninterested, etc.
3. Embarrassed
4. Dominative
 - (a) Integrative
5. Insecure
6. Politely
7. Enjoys correct response
8. Resents incorrect response
9. Can't tell
10. Seeks physical contact with person being educated
11. Acceptance of blame
12. Putting decisions up to the children
13. Discouraging

14. Encouraging
15. Hostile, ridiculing, sarcastic, belittling
16. Relatively mobile
17. Relatively immobile
18. Personalizing
 - (a) Use of request sentence with name
 - (b) Use of name only
 - (c) Use of hand-name technique
 - (d) Use of equalizing, levelling term like 'comrade'
19. Depersonalizing
 - (a) Use of class seating plan for recitation in succession
 - (b) Use of 'next' or some such impersonal device
 - (c) Use of 'you' instead of name
 - (d) Pointing, nodding, looking
20. Irritable
21. Accepts approach
22. Repels approach
23. Accepting of child's spontaneous expressions
24. Rejecting of child's spontaneous expressions
25. Humorous
26. Handles anxiety, hostility, discomfort, etc.
27. Acts and/or talks as if child's self-image is fragile
28. Acts and/or talks as if child's self-image is irrelevant
29. Defends child against peers
30. Responds to nonverbal cue other than hand-raising
31. Excessively polite
32. Keeps word
33. Fails to keep word
34. Praises and rewards realistically
35. Praises and rewards indiscriminately
36. Critical
37. Does not reward correct answer or good performance
38. Does not punish incorrect answer or poor performance
39. Acknowledges own error
40. Uses affectional terms like 'honey' or 'dear'
41. Awakens anticipation
42. The inclusive plural

IX. What forms of conduct control (discipline) are used?

1. Relaxed
2. Tight
3. Sense of propriety
4. Affectivity
5. Reprimand
 - (a) Direct
 - (b) Gentle
 - (c) Mixed
 - (d) Impersonal

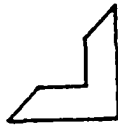
6. Ridicule
7. Exhortation
8. Command
9. Command question or request
10. 'We' technique
11. Instilling guilt
12. Cessation of activity
13. Group sanction
14. Threat
15. Putting the child on his mettle
16. Nonverbal signal
17. Reward
18. Promise of reward
19. Special stratagems
20. Awakening fear
21. Using a higher power
 - (a) Human
 - (b) Non-human
22. Exclusion
23. Punishment
24. Encourages peer-group control

APPENDIX B: THE GROUP EMBEDDED FIGURES TEST

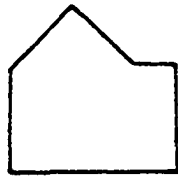
The following four simple/complex figures are taken from the practice section of the Group Embedded Figures Test.

Simple Figure

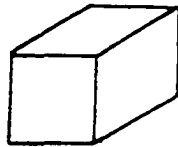
C



D



E

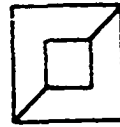


F



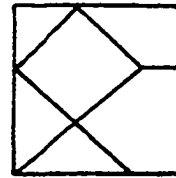
Complex Figure

5



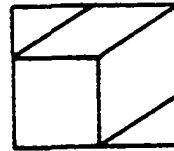
Find Simple Form "C"

3



Find Simple Form "D"

4



Find Simple Form "E"

6



Find Simple Form "F"

APPENDIX C: THE MODIFIED CONSENT FORM

MODIFIED CONSENT FORM

I agree to be observed in the classroom for three hours each week beginning January 9, 1979 until May 10, 1979 as a part of a study of teacher behavior.

The nature and general purpose of the research procedure have been explained to me.

I understand that any further inquiries I make concerning this procedure will be answered. I understand my identity will not be revealed in any publication, document, recording, photograph, computer data storage, or in any other way which relates to this research. Finally, I understand that I am free to withdraw my consent and discontinue participation in the research at any time.

Signed _____
(Teacher)

Date _____

Kent Koppelman
Researcher

APPENDIX D: CHECKLISTS FOR INSTRUCTIONAL PROCEDURES
AND INSTRUCTIONAL INTERACTION

INSTRUCTIONAL PROCEDURESThe Teacher Is Directive:

- 1. requires recall (rote memory).
- 2. demonstrates (e.g. an experiment).
- 3. lectures.
- 4. commands students.
- 5. has student reports.
- 6. uses repetition.
- 7. identifies objects (underlining nouns on the chalkboard).
- 8. does work for a student.
- 9. gives decisions which are manipulative ("Should we finish our math now or skip the movie this afternoon and do it then?")
- 10. reinforces racial/sexual stereotypes.
- 11. has controlled discussions (asking leading questions).
- 12. tells how:
 - a. reveals answers.
 - b. explains something.
 - c. gives directions.

The Teacher Is Receptive, Supportive:

- 13. accepts or encourages student's ideas.
- 14. gives commands in the form of a question or request.
- 15. works with an individual student.
- 16. gives "strokes" (personal recognition to stimulate effort on task).
- 17. gives praise:
 - a. for the quality of the student's work.
 - b. for completion of the task or for cooperation.
- 18. moves toward a student.¹

The Teacher Is Analytical, Logical:

- 19. uses a problem solving approach.
- 20. reminds students of the consequences for getting the work done (reward) or for failing to get it done (punishment).
- 21. awakens anticipation ("What do you think the character will do?").
- 22. states the opposite of the truth (playing the devil's advocate).
- 23. explains the reasons for a task or command.

¹This category was inconsistently recorded in the field notes and was therefore deleted.

INSTRUCTIONAL PROCEDURESThe Teacher is Demanding, Setting Standards:

- 24. rejects or discourages student's ideas.
- 25. sets an example (imitation).
- 26. asks for or accepts volunteers.
- 27. puts the child on his mettle ("Now let's see how well you can read today.").
- 28. instructs in a racial/sexual bias free manner.
- 29. uses threats or "fear" tactics.

The Teacher Includes Supplementary Experiences:

- 30. dramatizes events.
- 31. uses games.
- 32. uses pictures, illustrations.
- 33. uses humor.
- 34. has students work in small groups.
- 35. associates information in the material with something else.
- 36. associates information with the teacher's experience (self-disclosure).
- 37. relates information to the child's experience.
- 38. having open group discussions (asking open-ended questions).

INSTRUCTIONAL INTERACTIONTeacher As Antagonist

The teacher responds to the students by:

- 1. being hostile or sarcastic.
- 2. resenting an incorrect response.
- 3. not rewarding correct answers or good performances.
- 4. ridiculing students.
- 5. having an outburst of anger.

Teacher As Critic

The teacher responds to the students by:

- 6. giving a gentle reprimand.
- 7. giving a firm reprimand.
- 8. discouraging a student.
- 9. instilling guilt.
- 10. threatening to withdraw the teacher's affection.
- 11. referring student to a higher authority (principal, parent).
- 12. remaining silent. ("Tom, I'm waiting for you.").
- 13. criticizing or accusing.

Teacher As Nurturer

The Teacher supports the student as a person by:

- 14. being friendly and familiar with the child.
- 15. joking, teasing, being humorous.
- 16. calling a student by an affectionate name or nickname (honey, dear).
- 17. defending a child against other students.
- 18. not punishing incorrect answers or poor performances.
- 19. engaging in physical contact with students.
 - a. touching students.
 - b. allowing students to touch him or her.

The Teacher supports the student as a learner by:

- 20. enjoying a correct response.
- 21. encouraging a student.
- 22. being eager, enthusiastic about the student's work.
- 23. accepting blame, admitting mistakes.
- 24. encouraging peer group control or interaction.
- 25. using "we" to refer to she or he and the class.

INSTRUCTIONAL INTERACTIONTeacher As Stranger

The teacher responds to the students by:

- 26. being bored, indifferent, or inattentive.
- 27. being defensive.
- 28. being embarrassed, insecure.
- 29. being aloof and formal with the child.
- 30. use of "you," nodding or pointing instead of using the student's name.
- 31. ignoring a student who seeks attention.
- 32. ignoring apparently quiet, submissive students.

Teacher As Manager

The teacher responds to the students by:

- 32. calling on students who have their hands raised.
- 33. reacting to nonverbal cues other than hand raising.
- 34. calling for a sense of propriety.
- 35. exhorting students ("I can't hear any of you, let one person talk.").
- 36. giving warnings regarding future conduct ("When the sixth grade comes in we should all sit very still and be quiet.").
- 37. giving an impersonal response ("We're waiting for some of you to finish.").
- 38. using meaningful gestures (snaps fingers, points).
- 39. using meaningful facial expressions (includes staring at a student).
- 40. giving designated punishments (writing something fifty times).
- 41. excluding student from others.

APPENDIX E: ADDITIONAL FIELD-DEPENDENT-INDEPENDENT DATA
FROM THE INSTRUCTIONAL INTERACTION CHECKLIST

INSTRUCTIONAL INTERACTION

Field-Dependent		Field-Independent		
A	B	C	D	E
5	5	0	1	4
0	1	0	1	1
1	0	0	0	1
0	0	0	0	0
1	0	1	1	0
7	6	1	3	6

Teacher As Antagonist

The teacher responds to the students by:

1. being hostile or sarcastic.
2. resenting an incorrect response.
3. not rewarding correct answers or good performances.
4. ridiculing students.
5. having an outburst of anger.

Total Tallies for Teacher As Antagonist

A	B	C	D	E
0	5	0	1	2
3	0	0	0	2
1	0	0	0	0
1	2	4	3	0
3	0	1	0	1
0	10	5	1	9
1	2	1	1	1
9	19	11	6	15

Teacher As Stranger

The teacher responds to the students by:

26. being bored, indifferent, or inattentive.
27. being defensive.
28. being embarrassed, insecure.
29. being aloof and formal with the child.
30. use of "you", nodding or pointing instead of using the student's name.
31. ignoring a student who seeks attention.
32. ignoring apparently quiet, submissive students.

Total Tallies for Teacher as Stranger

APPENDIX F: ADDITIONAL MALE-FEMALE DATA FROM THE
INSTRUCTIONAL PROCEDURES AND INSTRUCTIONAL INTERACTION CHECKLISTS

INSTRUCTIONAL PROCEDURES

Male		Female		
A	B	C	D	E
0	0	2	0	1
1	0	10	12	5
0	0	12	14	9
111	26	76	33	15
0	0	0	1	2
2	2	5	11	3
0	2	3	5	2
13	1	13	1	1
2	0	2	0	4
0	0	5	0	2
4	7	29	30	13
65	66	51	51	32
23	4	12	2	2
14	35	20	27	18
28	27	19	22	12
198	104	208	158	89

The Teacher Is Directive:

1. requires recall (rote memory).
2. demonstrates (e.g. an experiment).
3. lectures.
4. commands students.
5. has student reports.
6. uses repetition.
7. identifies objects (underlining nouns on the chalkboard).
8. does work for a student.
9. gives decisions which are manipulative ("Should we finish our math now or skip the movie this afternoon and do it then?")
10. reinforces racial/sexual stereotypes.
11. has controlled discussions (asking leading questions).
12. tells how:
 - a. reveals answers.
 - b. explains something.
 - c. gives directions.

Total Tallies for Directive

INSTRUCTIONAL PROCEDURES

Male		Female		
A	B	C	D	E
7	26	5	28	26
3	11	3	5	5
0	11	3	18	6
0	0	0	0	0
11	23	6	28	20
21	71	17	79	57

The Teacher Is Analytical, Logical:

19. uses a problem solving approach.
20. reminds students of the consequences for getting the work done (reward) or for failing to get it done (punishment).
21. awakens anticipation ("What do you think the character will do?")
22. states the opposite of the truth (playing the devil's advocate).
23. explains the reasons for a task or command.

Total Tallies for Analytical, Logical

A	B	C	D	E
7	13	1	2	3
3	0	5	4	4
10	4	6	19	12
4	14	6	16	14
0	2	2	2	1
4	4	10	1	1
28	37	30	44	35

The Teacher Is Demanding, Setting Standards:

24. rejects or discourages student's ideas.
25. sets an example (imitation).
26. asks for or accepts volunteers.
27. puts the child on his mettle ("Now let's see how well you can read today.")
28. instructs in a racial/sexual bias free manner.
29. uses threats or "fear" tactics.

Total Tallies for Demanding, Setting Standards

INSTRUCTIONAL INTERACTION

Male		Female		
A	B	C	D	E
5	1	5	0	4
1	1	0	0	1
0	0	1	0	1
0	0	0	0	0
0	1	1	1	0
6	3	7	1	6

Teacher As Antagonist

The teacher responds to the students by:

1. being hostile or sarcastic.
2. resenting an incorrect response.
3. not rewarding correct answers or good performances.
4. ridiculing students.
5. having an outburst of anger.

Total Tallies for Teacher As Antagonist

A	B	C	D	E
3	5	15	7	5
6	7	5	13	3
5	4	4	1	2
0	3	0	3	1
0	0	0	0	0
1	0	1	0	0
2	2	0	6	0
42	16	54	4	16
59	37	79	34	27

Teacher As Critic

The teacher responds to the students by:

6. giving a gentle reprimand.
7. giving a firm reprimand.
8. discouraging a student.
9. instilling guilt.
10. threatening to withdraw the teacher's affection.
11. referring student to a higher authority (principal, parent).
12. remaining silent. ("Tom, I'm waiting for you.").
13. criticizing or accusing.

Total Tallies for Teacher As Critic

INSTRUCTIONAL INTERACTION

Male		Female		
A	B	C	D	E
85	42	118	28	18
23	12	40	11	4
16	6	29	1	11
0	0	8	0	0
0	1	1	2	1
2	0	0	2	2
44	23	40	12	0
18	21	34	12	0
11	17	26	10	0
12	6	3	2	0
26	2	6	0	0

26	57	31	103	41
2	17	8	17	2
3	18	13	26	5
3	8	5	7	1
3	1	1	4	1
4	9	1	21	14
11	4	3	28	18
111	99	149	131	59

Teacher as Nurturer

The teacher supports the student as a person.

14. being friendly and familiar with the child.

15. joking, teasing, being humorous.

16. calling a student by an affectionate name or nickname (honey, dear).

17. defending a child against other students.

18. not punishing incorrect answers or poor performances.

19. engaging in physical contact with students.

a. touching students

1.) supportive

2.) disciplinary

b. allowing students to touch him or her.

The teacher supports the student as a learner.

20. enjoying a correct response.

21. encouraging a student.

22. being eager, enthusiastic about the student's work.

23. accepting blame, admitting mistakes.

24. encouraging peer group control or interaction.

25. using "we" to refer to she or he & class.

GRAND TOTAL Tallies for Teacher as Nurturer

INSTRUCTIONAL INTERACTION

Male		Female		
A	B	C	D	E
5	1	0	0	2
0	0	3	0	2
0	0	1	0	0
2	3	1	4	0
0	0	3	1	1
10	1	0	5	9
2	1	1	1	1
19	6	9	11	15

Teacher As Stranger

The teacher responds to the students by:

- 26. being bored, indifferent, or inattentive.
- 27. being defensive.
- 28. being embarrassed, insecure.
- 29. being aloof and formal with the child.
- 30. use of "you," nodding or pointing instead of using the student's name.
- 31. ignoring a student who seeks attention.
- 32. ignoring apparently quiet, submissive students

Total Tallies for Teacher As Stranger