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# A STUDY OF TEACHER-PUPIL INTERACTION AS IT RELATES TO DIFFERENTIAL TEACHER EXPECTATIONS AND SELECTED TEACHER CHARACTERISTICS

by

© DAVID GARTH MUTTART

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Study of Teacher-Pupil Interaction as it Relates to Differential Teacher Expectations and Selected Teacher Characteristics submitted by David Garth Muttart in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Elementary Education.

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ABSTRACT

The purpose of the study was two-fold. The major purpose was to determine whether teachers treat children differently on the basis of performance expectations. Particular emphasis was placed on investigating differences among teachers with regard to this phenomenon. A secondary purpose was to provide initial investigation into relationships between selected teacher characteristics and the nature of differential teacher behavior.

Six teachers, one at each of the first, third, and sixth grade levels in two schools, volunteered to participate in the study. Coders were trained in the use of the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System. Approximately 14 hours of interaction data was collected in each classroom, during Language Arts classes, over a period of two weeks. Teachers ranked pupils according to expected achievement. Those ranked in the top one-third of the class were identified as high expectancy children and those ranked in the bottom one-third of the class were identified as low expectancy children. Teacher characteristics were described in terms of scores obtained on the Sixteen Personality Factor Questionnaire (16 PF), the This I Believe (TIB) test, and the Minnesota Teacher Attitude Inventory (MTAI). Both expectation and teacher presage data were collected following the period of classroom observation.

Relationships between teacher expectations and teacher-pupil interaction were investigated using teacher rankings of pupils and 33 interaction variables derived from the classroom observation system. The data were analyzed by classroom. Both inductive (t test analysis)

and descriptive (individual pupil data and group percentages) statistics were employed. Few statistically significant differences were found in most classrooms. Conclusions were based on trends in the data. Findings indicated that three of the six teachers behaved differently toward children on the basis of performance expectations. Two initiated more work-related interaction with low expectancy children while one favored highs in the initiation of work-related contact. It was concluded that, while some teachers behave differently toward children on the basis of performance expectations, the phenomenon is neither universal nor is the direction of differential behavior consistent among teachers. It was further concluded that findings permitted the classification of teachers according to typologies hypothesized by Brophy and Good (1974).

In the second stage of analysis, teachers were classified according to type (i.e., proactive, reactive, overreactive) and scores obtained on the 16 PF, the TIB, and the MTAI were examined to determine whether any of the personality dimensions discriminated among teachers on the basis of type. Descriptive procedures were used. Prima facie evidence was found that suggested that six of the personality dimensions of the 16 PF so discriminated. It was concluded that these relationships warrant further investigation.

# PREFACE

Despite years of educational research relatively little is known about what constitutes effective teaching. In 1953 the Committee on the Criteria of Teaching Effectiveness of the American Educational Research Association reported:

> The simple fact of the matter is, that after 40 years of research on teacher effectiveness during which a vast number of studies have been carried out, one can point to few outcomes that a superintendent of schools can safely employ in hiring a teacher or granting him tenure, that any agency can employ in certifying teachers, or that a teacher education faculty can employ in planning or improving teacher education programs. (p. 657)

In more recent years other reviewers have expressed similar concerns (Rosenshine and Furst, 1973; Heath and Neilson, 1974; Dunkin & Biddle, 1974; Berliner, 1976). The positive consequence of this situation has been a major effort to discover reasons for such disappointing findings. Researchers have identified weaknesses in past research and have offered a number of recommendations for future investigation of the teaching-learning process. Four recommendations are particularly evident in current educational literature:

1. An essential ingredient of any investigation of teaching and learning should be the observation of teaching activities. Much of the early research failed to observe classroom interaction and concentrated only on the study of antecedents and consequences of such interaction (Medley and Mitzel, 1963; Dunkin and Biddle, 1974).

2. Research on teaching should employ paradigms that facilitate the investigation of a large number of variables. Insight into the teaching-learning process requires knowledge of complex interrelationships.

A research project, therefore, should incorporate variables relating to the properties of teachers and pupils; characteristics of the classroom, school and community; desired outcomes of the educational enterprise; and the actual behaviors of teachers and learners (Rosenshine and Furst, 1974; Dunkin and Biddle, 1974).

Realization of this goal requires either large-scale cooperative research projects or a series of smaller, well-coordinated investigations. Clifford (1973) has suggested that such research endeavors are rare but, because fragmented research is likely to have little impact, they should be strongly encouraged (p. 35).

3. Research on teaching should be carried out in naturalistic settings. Laboratory research lacks generalizability to the real world of teachers and learners. It cannot reproduce the multitude of situational factors that operate in classrooms where teachers and pupils interact on a day-to-day basis.

> They [laboratory settings] contrast in so many ways with naturalistic settings that their findings cannot be generalized confidently without first redoing the entire study in a naturalistic setting. (Good, Biddle, and Brophy, 1975, p. 37)

4. Studies involving classroom interaction should focus on individual pupils. Despite emphasis on individual differences and the fact that teachers are constantly encouraged to adjust instructional behavior to the needs of the individual, most classroom research has focused only on teacher behavior directed toward the class as a group. Since teachers interact differently with different students, it is necessary to monitor teacher-pupil dyadic interaction in order to obtain a realistic view of the classroom. To restrict observation to group interaction will not only provide incomplete data but could completely

distort reality. Brophy and Good (1974) explain:

> In the extreme case where the teacher acts one way toward one group of students and another way toward the rest of the students, a single index representing his "average" score would not be representative of his behavior toward any of his students. (p. 5)

The present study was part of a larger investigation designed to examine relationships among pupil characteristics, teacher characteristics, contextual variables, teaching goals, teacher thought processes, teacher and pupil behavior, and pupil outcomes. The investigation was undertaken in an attempt to help explain what makes a difference in the teaching-learning process. It was encouraged by insights and recommendations appearing in recent literature and resulting from a half century of educational research. The recommendations presented above were basic to guiding the larger investigation and, thus, the present study. The precise rationale and procedures for the research project are elaborated in Eggert, Fasano, Mahen, Marland, Moody, and Muttart (1976).

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# THE PROBLEM

## BACKGROUND TO THE STUDY

During the past decade the relationship between teacher expectations and pupil achievement has received increasing attention in educational literature. The catalyst for much of this attention was the controversial Pygmalion experiment reported by Rosenthal and Jacobson (1968). Although the findings of this experiment were demonstrated to be of questionalbe validity, educators continued to be attracted to the notion that pupil achievement might somehow be related to teacher expectations. Investigators have used a variety of research paradigms to examine different aspects of the self-fulfilling prophecy hypothesis.

The findings of this body of research are mixed and difficult to interpret. It appears, however, that the evidence weighs in favor of the existence of expectation effects. Such effects have been found in studies involving both experimentally induced and naturally formed teacher expectations. They have been found in both process measures (teacher-pupil interaction) and product measures (pupil achievement). Baker and Crist (1971) reviewed 25 teacher expectation studies and concluded:

> 1. Teacher expectancy probably does not affect pupil I.Q.
> 2. Teacher expectancy may affect pupil achievement. Significant effects are likely if a strong teacher expectancy exists naturally or if the induction is strong... Effects on achievement may be somewhat more likely on teacher-controlled achievement measures and less likely on standardized achievement measures.

3. Teacher expectancy probably affects observable teacher and pupil behavior, if the expectancy occurs naturally or provides a moderate to strong manipulation of inducement. (pp. 61-62)

Jansen, Jensen and Mylov (1972) state:

> Some investigations... have tried to determine whether a teacher's expectations are related to his teaching behavior. The investigations covered in this review confirm in different ways that there is such a relationship. (p. 537)

And Good and Brophy (1974) maintain that "evidence from many different sources show that expectation effects are a fact, not a fluke" (p. 116).

The most convincing evidence of expectation effects derives from research involving naturally formed teacher expectations and using process measures as dependent variables. Such research has an impressive record in demonstrating that teachers behave differently toward pupils for whom they hold differential expectations. It appears necessary, however, to make certain observations concerning this body of research.

1. Evidence of differential teacher behavior does not establish the existence of expectation effects in the Pygmalion sense. A number of researchers have hypothesized a relationship between process expectation effects and product expectation effects. Brophy and Good (1970) posited a model conceptualizing the processes underlying the self-fulfilling prophecy hypothesis. The model, therefore, provides a theoretical link between process and product expectation effects.

> (a) The teacher forms differential expectations for pupil performance; (b) He then behaves to treat children differently in accordance with his differential expectations; (c) The children respond differentially to the teacher because they are being treated differently and (d) In responding to the teacher, each child tends to exhibit behavior which complements and reinforces the teacher's particular expectations for him; (e) As a result, the general academic performance for some children will be enhanced while that of others will be depressed,

> with changes being in the direction of teacher expectations; (f) These effects will show up in achievement tests given at the end of the year, providing support for the "self-fulfilling prophecy" notion. (pp. 365 - 366)

Brophy and Good (1974) provided further explanation as to how the relationship might operate.

> If a teacher attempts to teach more material to highs, spends more time with them, calls on them more often, is more encouraging toward them, and persists in trying to teach them when they do not learn the first time, these students are virtually certain to learn more than low expectation students who did not get this kind of teacher treatment. In addition to their direct effects on student opportunity to learn, teacher expectations also have indirect effects on student achievement via the effects on student motivation, level of aspiration, and self-concept. (p. 117)

Firestone and Brody (1975) elaborate the possible indirect effects of differential teacher behavior.

> Repeatedly being treated in a manner that indicates that they are not worth much and that little good is expected of them might lead students to internalize these expectations... Being more frequently exposed to negative reactions from the teacher, one can safely assume, does not aid the child in his efforts to feel worthwhile and capable... Perhaps these feelings of not being worthwhile or successful lead to a lessening of motivation and starts the prophecy on its way. Similarly, being more frequently chosen... may communicate to the child that he or she is special and increases his or her motivation. (p. 550)

Although logical and attractive in theory, this relationship has yet to be adequately researched. Only one study (Meichenbaum, Bowers, and Ross, 1969) has both provided support for the self-fulfilling prophecy hypothesis (product effects) and provided insight into the causal mechanisms through which the phenomenon may be mediated (process effects). There is a need for further research examining the relationship between process expectation effects and pupil achievement.

2. A number of researchers (Evertson, Brophy, and Good, 1972; Evertson, Brophy and Good, 1973; Brophy, Evertson, Harris, and Good,

1973) have demonstrated that only some teachers treat students differently on the basis of expectations. Further, it seems clear that the nature of differential treatment can vary from teacher to teacher. Brophy and Good (1974) state:

> We now distinguish among three general types of teachers with regard to their susceptibility to expectation effects: proactive teachers, passive or reactive teachers, and overreactive teachers. (p. 115) Proactive teachers appear to be undeterred by their expectations for low achieving students, so that they spend more time interacting with lows than highs. Reactive teachers simply allow existing differences between high and low students to unfold, so that highs, due to their own initiative and ability, come to dominate public classroom life. [The] third class of teachers overreact to student differences (in supplying qualitatively and quantitatively superior treatment to highs), thus exacerbating differences between students. (p. 303)

No research has attempted to identify the individual difference variables in teachers that are related to such differential treatment of pupils. The lack of research in this area represents a major gap in present knowledge concerning the nature of process expectation effects. Brophy and Good (1974) suggest that "data are needed to identify the teacher characteristics which make teachers more or less susceptible to [expectation] effects" (p. 110).

3. Although research demonstrating process expectation effects is convincing, the actual number of studies conducted has been relatively small. Also, because classroom observation is expensive in both time and money, the number of teachers and contexts represented in the research program has been somewhat limited. The validity and generalizability of findings will be enhanced as replication studies accumulate.

## PURPOSE OF THE STUDY

The study focused on two of the three areas of concern discussed above. The purpose, therefore, was two-fold. The major purpose was to investigate relationships between differential teacher expectations and the nature of teacher-pupil interaction. As such, it was an attempt to replicate findings of recent research suggesting that some teachers interact more frequently and more positively with children for whom they hold high performance expectations.

A secondary purpose was to provide initial investigation into the antecedents of process expectation effects. Specifically, an attempt was made to describe relationships between selected teacher characteristics and differential teacher behavior.

## RESEARCH QUESTIONS

1. Do teachers interact differently with pupils for whom they hold high performance expectations than with pupils for whom they hold low performance expectations? If so, what is the nature of such differential interaction?

   More specifically:

   a. Do differences exist in the frequency and type of teacher interaction with high and low expectancy children?

   b. Do teachers respond to pupil participation in ways that indicate a systematic favoring (e.g., provide more encouragement; provide more direct opportunity to learn) of either high or low expectancy children?

2. What relationships exist between process expectation effects

and selected teacher characteristics?

More specifically:

a. What relationships exist between each of the personality traits measured by the Sixteen Personality Factor Questionnaire (16 PF) and the nature of teacher susceptibility to process expectation effects?

b. What relationships exist between teacher belief orientation, as measured by the This I Believe (TIB) Test, and the nature of teacher susceptibility to process expectation effects?

c. What relationships exist between teacher attitudes toward children, as measured by the Minnesota Teacher Attitude Inventory (MTAI), and the nature of teacher susceptibility to process expectation effects?

## DEFINITIONS

Two terms used throughout the study are defined as follows:

Expectations. Expectations are inferences teachers make about the performance potential of children. They are based on a wide range of input factors. Such inputs as past performance, I.Q., and day-to-day contact in classroom life (e.g., observations regarding student interest, behavior, and success in meeting the demands of the curriculum) are all likely to influence the formation of expectations concerning an individual child. Holding expectations is a normal part of human experience. Brophy and Good (1974) explain:

> Teacher expectations regarding students are simply a special case of the more general phenomenon that we all make observations and inferences about people on the basis of what we hear about

them and what we see of them in everyday interactions. (p. 33)

Expectation effects. Expectation effects refer to the communication of teachers' expectations to children. When teacher behavior is such that it has the potential of communicating expectations to children, expectation effects are said to be operating. Expectations may be communicated in a number of ways. The teacher may tell a student directly that she holds high or low expectations for him (e.g., tell him that work is too easy or too difficult). More typically, however, expectations are communicated in indirect ways. The teacher may communicate expectations through the amount and quality of attention she affords individual children.

## LIMITATIONS

The principal limitations of the study are:

1. The sample of teachers was small.
2. Random sampling techniques were not used.
3. Classroom observation was not spaced over a large portion of the school year.

In particular, the nature of the sample does not permit generalization of findings beyond the teachers used in the study.

## SUMMARY

This chapter has presented the problem central to the study. The problem was two-fold. First, research in natural settings, using process measures as dependent variables, has been consistent in demonstrating that teacher expectations are related to teaching behavior. The actual number

of teachers and contexts represented in such research, however, has been relatively small. Second, the lack of research attempting to identify individual difference variables in teachers that are related to differential treatment of students represents a major gap in the area of expectancy literature. The chapter also presented the research questions, defined terms used in the study, and stated the limitations of the study. The principal limitations related to the size and nature of the research sample. Chapter 2 reviews the literature pertinent to the study.

Chapter 2

# RELATED LITERATURE

This chapter will review literature concerning the influence of teacher expectations on teacher-pupil interaction and pupil attainment. It is from this literature that the conceptual framework for the study derives. The review is presented in three sections: (1) research involving experimentally induced expectations, (2) research involving naturally formed expectations, and (3) teacher presage research.

## RESEARCH INVOLVING EXPERIMENTALLY INDUCED EXPECTATIONS

In 1968 Rosenthal and Jacobson published the controversial Pygmalion in the Classroom. This book recounted an experiment in which 18 elementary school teachers were given false information concerning certain of their students. Teachers were informed that test results had indicated students were "late bloomers" and could be expected to make unusual academic gains during the school year. In reality a group I.Q. test, Tests of General Ability (TOGA), had been administered and "late bloomers" were identified randomly. Readministration of the test enabled the calculation of I.Q. gain scores. The authors reported that findings provided evidence that teacher expectations for individual pupils can function as self-fulfilling prophecies. They stated:

> It appears now that teachers' favorable expectations can be responsible for gains in their pupils' I.Q.s and, for the lower grades, that these gains can be quite dramatic. (p. 98)

Reaction to the Rosenthal and Jacobson study was dramatic. While

the popular press accepted the findings and editorialized their implications, knowledgeable researchers (Thorndike, 1968; Snow, 1969; Taylor, 1970; Elashoff and Snow, 1971) questioned the findings so ably that they have generally become regarded as untrustworthy. Thorndike (1968) stated "it is so defective technically that one can only regret that it ever got beyond the eyes of the original investigators" (p. 708).

Although reviewers were severely critical of the Pygmalion experiment, they remained open to the possible existence of an expectancy phenomenon. Thorndike (1969) stated:

> Let me express a very real interest in the notion of the "self-fulfilling prophecy"... Perhaps others can learn from Pygmalion's shortcomings, and carry out research on these problems that is psychometrically and experimentally adequate. (p. 71)

Gage (1971) stated:

> Do teachers' expectations affect things other than I.Q.... Here affirmative answers seem highly plausible on the basis of much previous research. (p. v)

The international publicity afforded Pygmalion in the Classroom and the openness of its severest critics to the theoretical logic of expectancy effects resulted in widespread interest in the expectancy phenomenon, interest that had not been generated by earlier studies (Pitt, 1956; , 1966). Gage (1971) stated:

> The positive residue of the Pygmalion affair is renewed attention to the hypothesis that teachers' expectations make a difference in the classroom. Research workers are now taking a fresh look at these phenomena. (p. v)

A number of researchers have undertaken studies very similar to the Rosenthal and Jacobson experiment. Although typically reported as replication studies, each investigation differed from the original in one or more ways. The grade level of subjects, the method of induction,

the nature of criterion variables, and the length of experiment treatment were frequently altered. The most common departure from the original design involved investigators attempting to increase the possibility of finding expectation effects by using criterion variables which were more susceptible to alteration than is I.Q. Gage (1971) suggested that attempts to validate the expectancy hypothesis through examining gains in I.Q. were futile.

> Half a century of research has shown that [changes in I.Q.] are hard to make. They have been claimed by persons using intensive treatments in preschools. They have been effected by profound alterations in the persons environment - alterations like moving out of a barren orphanage into an enriched middle-class home. But, even so, no one has yet been able to change I.Q. substantially in any controlled and consistent way. We cannot improve I.Q. as dependably as we can improve knowledge of mathematics or languages. (p. iv)

The first quasi-replication was conducted by Claiborn (1969). This study differed from the Pygmalion experiment in that subjects were located in grade one classrooms only, dependent variables included teacher-pupil interaction measures as well as I.Q. gains (TOGA), and the experimental treatment lasted only two months. Claiborn reported that findings failed to support the expectation hypothesis. There were no differences on ...ner I.Q. gains or measures of teacher-pupil interaction. José and Cody (1971) conducted a "replication" study involving grade one and two pupils. Expectations were induced in the usual way and dependent variables were I.Q. gain (TOGA), achievement gains in reading and mathematics as measured by the Metropolitan Achievement Tests (MAT), and measures of pupil-teacher interaction. Expectations were induced early in the second terms and posttests were completed 16 weeks later. The treatment, therefore, while stronger than in the

Claiborn study, was still weaker than in the Pygmalion experiment. The researchers reported no evidence of expectation effects on any of the criterion measures.

Goldsmith and Fry (1970) conducted a study in which the experimental treatment lasted five months. They attempted to further strengthen the treatment by reminding teachers of the identity of "bloomers" on numerous occasions during the treatment period. This study used 224 high school students as subjects and I.Q. gains (TOGA) and achievement test gains (Sequential Tests of Educational Progress - STEP) as dependent variables. Again, there were no findings that could be taken as support for the expectation hypothesis. Other "replication" studies have reported similar negative findings (Conn, Edwards, Rosenthal, and Crowne, 1968; Evans and Rosenthal, 1969; Fielder, Cohen, and Feeney, 1971). These studies are reviewed by Baker and Crist (1971) and Brophy and Good (1974).

In addition to the studies reported above, a number of investigators have departed from the Rosenthal tradition and have used different research paradigms to examine the effects of experimentally induced expectations. Although many researchers have reported negative findings (Fleming and Anttonen, 1971; Mendels and Flanders, 1973; O'Connel, Dusek, and Wheeler, 1974; Wilkins and Glock, 1975), others have produced findings which support the notion of self-fulfilling prophecy.

Schrank (1968) found that expectations held by Air Force instructors influenced the achievement of recruits in a mathematics course. Students were assigned randomly to one of five classes and classes were presented to instructors as being grouped on the basis of

ability. Findings indicated that students in the "highest" ability group achieved significantly better on a criterion referenced mathematics test than students in the "lowest" ability group.

Beez (1970) found that expectations held by graduate student tutors influenced both the amount they attempted to teach and the amount which tutored pupils learned. Sixty graduate students were instructed to teach an assigned preschool child as many words as possible during a ten-minute period. Tutors were informed that children were either high or low ability pupils. In reality, these labels were assigned randomly. Findings revealed that tutors attempted to teach "highs" significantly more words, that "highs" actually learned significantly more words, and that "high" ability children were consistently rated as brighter than "low" ability children.

Meichenbaum, Bowers, and Ross (1969) conducted a study designed to investigate the influence of teacher expectations on pupil achievement and to identify the mediating variables underlying possible achievement differences. Subjects were 14 adolescent offenders in a training school. Criterion variables were subjective and objective achievement test scores and measures of the classroom behavior of four teachers toward the subjects. Procedures for identifying "late bloomers" included having teachers designate subjects as either good or poor students, randomly choosing three good students and three poor students as "bloomers", and informing teachers that this status was revealed through psychological test data. The experimental treatment lasted two weeks. Pre and post test scores were obtained on teacher graded examinations and teacher behavior toward pupils was noted as positive, negative or

neutral. It was found that "bloomers" achieved significantly better on objective achievement tests and teacher behavior ratings indicated that "bloomers" enjoyed more positive and fewer negative interactions with teachers. Thus, findings not only provided support for the expectation hypothesis, but also provided insight into the causal mechanisms leading to the expectancy advantage.

Kester and Letchworth (1972) also investigated the influence of teacher expectations on both product and process measures. Subjects were 150 average ability grade seven students randomly assigned to experimental and control groups. Product measures included pretest - posttest scores on an I.Q. test (Otis-Lennon), an achievement test (Stanford Achievement Test), and an attitude scale. Process measures were derived from observations of pupil-teacher interaction. Expectation induction occurred during the first week of school and involved informing teachers that certain pupils (experimental group) had qualified for inclusion in a study of the classroom behavior of "bright" students. The treatment lasted nine weeks. Findings revealed no significant differences in any of the product measures but interaction differences were observed. The investigators reported that teachers interacted more frequently and more positively with "bright" students.

A number of studies involving experimentally induced expectations have produced findings similar to the process results reported by Kester and Letchworth. Rothbart, Dalfen, and Barrett (1971) investigated differential teacher behavior in microteaching situations. Subjects were 13 female undergraduate teachers and 52 high school students. Expectation induction was completed for four students in each micro-

teaching group. Two were labeled as academically superior and two were labeled as lacking academic potential. Teacher behavior was observed during a 30 minute literature discussion. "Bright" students were found to receive more teacher attention but, unlike the Kester and Letchworth findings, no differences were observed in the quality of teacher-pupil interaction (i.e., praise and criticism). Rubovits and Maehr (1970) also used microteaching situations to investigate teacher differential behavior. The findings of this study more closely approximated those of Kester and Letchworth. Female undergraduate teachers were found to initiate more interactions and interact more positively with pupils labeled as "gifted". Subjects were sixth and seventh grade pupils. Medinnus and Unruh (1971) produced similar findings using Head Start pupils and teachers. In this study pupils labeled as "high ability" received significantly more praise and less criticism than pupils labeled as "low ability".

Discussion

Research involving experimentally induced expectations has produced mixed findings. Studies utilizing product measures have generally produced negative findings, while the majority of process investigations have reported positive results. This situation is open to a variety of interpretations. It may be that teacher expectations influence the nature of teacher-pupil interaction but, in fact, have no effect on pupil attainment. It may be that experimental treatments were not of sufficient duration to produce a product effect. It may be that mixed findings testify to the context specificity of the expectancy hypothesis. Finally, it might be that negative product findings were a

result of teachers not acquiring the expectations which were intended. A number of studies reported direct evidence that teachers failed to acquire intended expectations (Goldsmith and Fry, 1970; Fleming and Anttonen, 1971; José and Cody, 1971).

It is clear that evidence from this body of research does not indicate a basis for unequivocal acceptance of the self-fulfilling prophecy hypothesis. However, findings do suggest the necessity for further investigation. Mendels and Flanders (1973) state:

> The present study bears considerable resemblance to the entire literature on teacher expectation effects produced by artifically imposed experimental manipulations. While conclusive results were not found, a modicum of evidence was uncovered to indicate the existence of weak expectation effects... Because of the possible existence of such expectancy effects, the continued investigation of the subject seems warranted, especially in natural settings using natural inputs. (p. 210)

## RESEARCH INVOLVING NATURALLY FORMED EXPECTATIONS

In recent years there has been a marked trend toward expectancy research using naturally formed teacher expectations. Although a few studies have employed product measures, the vast majority have examined relationships between expectations and the nature of teacher-pupil interaction. Early research in the area (Dalton, 1969; Rist, 1970; Kranz, Weber, and Fishell, 1970) consistently indicated that teachers interact more frequently and more positively with students for whom they hold high expectations. This relationship was further examined in a series of investigations by Brophy, Good and colleagues using the Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System. This research program represents the most extensive, and perhaps the most intensive study of teacher differential behavior to

date.

The initial Brophy and Good investigation (Brophy and Good, 1970) examined relationships between teacher expectations and teacher-pupil interaction at the grade one level. Teachers were asked to rank pupils according to expected achievement. Six high and six low expectation students were chosen and observed for half days on four occasions. The study did not find the quantitative differences that were evident in previous research. In fact, while high expectation students initiated more interaction with teachers, the trend was for teachers to initiate more interaction with low expectation students. This was possibly a conscious attempt by teachers to compensate for the greater attention which highs attracted to themselves. Qualitative differences, however, were found to favor highs. High expectation students received significantly more praise and less criticism than did low expectation students.

This study, and subsequent investigations employing the Brophy-Good classroom observation instrument, examined a question that was virtually ignored in previous research. Is differential teacher behavior (quantitative and qualitative) the result of teachers methodically favoring high expectation students or is it the result of teachers simply responding to pupil behavior? That is, perhaps the greater frequency of interaction with high expectation students can be attributed to such students approaching the teacher more frequently. Perhaps the more positive interaction with high expectation students can be attributed to their behavior being such that it warrants more praise and less criticism. Research techniques employed in previous studies did not permit examination of this important question. The

observation instrument used by Brophy and Good permitted comparisons of teacher behavior toward high and low expectation groups in "equivalent situations". Findings discounted the possibility that differential teacher behavior occurred simply in response to pupil behavior. Analysis of "equivalent situations" revealed that not only did teachers praise low expectation students less and criticize them more, but that such differential behavior was not warranted in terms of pupil behavior. Findings further indicated that teachers made greater attempts to elicit good performance from high expectation students. Table 1 illustrates some of the more important findings of this aspect of the study.

This initial investigation was replicated by Evertson, Brophy and Good (1972). The replication study used nine grade one classes in three schools. Results indicated that teachers, as a group, did not interact more frequently or more positively with high expectation students. When individual teacher data was examined, however, it was found that three teachers did interact more frequently and more positively with high expectation students. Three others interacted more frequently and more positively with low expectation students, and the remaining teachers showed no definite patterns of interaction. Thus, in its failure to replicate the Brophy and Good (1970) findings, this study produced very significant information. Evidence indicated that differential treatment of students on the basis of expectations was an individual difference variable. Similar evidence was reported by Evertson, Brophy and Good (1973) and Brophy, Evertson, Harris and Good (1973).

Although evidence of differential teacher behavior provides

Table 1

Group Differences on Variables Related to the Communication of Expectation Effects (Initial Brophy and Good Study)

| Measures | Lows | Highs |
|---|---|---|
| Percent of correct answers followed by praise | 5.88 | 12.08** |
| Percent of wrong answers followed by criticism | 18.77 | 6.46*** |
| Percent of wrong answers followed by repetition or rephrasing the question or by giving a clue | 11.52 | 27.04* |
| Percent of reading problems followed by repetition or rephrasing the question or by giving a clue | 38.37 | 67.05*** |
| Percent of answers (correct or incorrect) not followed by any teacher feedback | 14.75 | 3.33*** |

Note: From Teacher-Student Relationships: Causes and Consequences by J. Brophy and T. Good, 1974, p. 98.

*$p < .10$

**$p < .05$

***$p < .01$

insight into possible causal mechanisms underlying a self-fulfilling prophecy phenomenon, empirical support for this hypothesis must come from research establishing relationships between teacher expectations and pupil attainment. Three studies have examined the effects of teacher expectations on pupil learning. Palardy (1969) conducted a tightly controlled investigation designed to examine the effects of teacher sex difference beliefs on the reading achievement of first grade pupils. From an initial sample of 63 teachers, 10 were identified who held sharply contrasting views concerning the relative ability of boys and girls to achieve in reading. Teachers who revealed sex difference beliefs were paired with teachers who held no such beliefs and the reading achievement of their students compared. Reading scores were adjusted to control for student ability. It was found that boys who were taught beginning reading by teachers who expected no sex difference achieved as well as girls, while boys who were taught by teachers expecting sex differences achieved less well (p. 374).

Good and Brophy (1974) cite research by Doyle, Hancock, and Kifer (1972) which produced similar findings. Also interested in the effect of teacher sex difference beliefs on reading achievement, these researchers had grade one teachers estimate the I.Q. of children in their classes. They found that, not only did teachers systematically overestimate the I.Q. of girls and underestimate that of boys, but also that the reading achievement for those overestimated was higher than their measured I.Q. would predict, while that for those underestimated was lower than measured I.Q. would predict. These findings support the thesis that, when teachers hold high expectations for students, they

actually produce higher achievement in those students than in students for whom they hold low expectations (Brophy and Good, 1974, p. 80).

Seaver (1971) used teacher experience with older siblings as a vehicle for investigating the influence of teacher expectations on pupil achievement. School records enabled the researcher to locate 79 pairs of siblings in two schools. Older siblings were classified as good or poor students on the basis of first grade I.Q., Stanford Achievement Test scores, and grade point average. Younger siblings were compared on the basis of performance on subtests of the Stanford Achievement Test. Analysis revealed that younger siblings of good students obtained higher achievement scores when assigned to the same teacher who had taught the older sibling, while younger siblings of poor students achieved better when assigned to a different teacher. The study, therefore, adds support to the self-fulfilling prophecy hypothesis.

Discussion

The research cited above demonstrates that naturally formed teacher expectations have been related to both differential teacher behavior and pupil achievement. Studies investigating relationships between teacher expectations and teacher-pupil interaction provide insights into how expectations might be communicated to pupils and thereby influence achievement. No naturalistic research, however, has incorporated both process and product measures in the same study so the link between differential teacher behavior and pupil achievement has not been empirically established.

A further significant finding emerges from this literature. Individual teachers behave in different ways toward high and low

expectation pupils. Not all teachers treat pupils in ways that are hypothesized to create self-fulfilling prophecy effects. Brophy and Good (1974) state:

> We believe that genuine expectation effects... have been convincingly demonstrated and are an established fact... but that they occur only in certain teachers. (p. 115)

No research has been conducted to determine teacher characteristics that will predict the nature of teacher differential behavior.

## TEACHER PRESAGE RESEARCH

A concern of the present study was the relationship between teacher presage variables and teacher behavior toward pupils for whom differing expectations are held. Brophy and Good (1974) state:

> In general it appears that the reality of expectation effects is now established, and that future research should concentrate on identifying the individual differences in teachers... that are related to these effects. (p. 122)

Although teacher characteristics have been studied since the early 1920's, little research has focused on the relationship between teacher characteristics and the differential treatment of pupils. In fact, little research has focused on the relationship between teacher characteristics and observed teacher behavior. The reason for this situation is that, until recently, teacher presage investigations have been concerned exclusively with predicting teacher effectiveness and teacher effectiveness has been described in terms of subjective ratings or measures of pupil achievement. Barr (1948) reviewed approximately 135 studies which appeared during the years following 1924. This body of research related personal qualities, professional knowledge and skill, and status factors to measures of teacher effectiveness. In no case

were variables studied in relation to direct measures of classroom behavior (Barr, 1948, pp. 207 - 211).

Getzels and Jackson (19[illegible] viewed teacher presage research for the period 1950 to 1960. In thi[illegible] view a similar pattern was evident. Although more sophisticated measurement and design techniques were used, studies were largely concerned with relating presage variables to such measures as grades in practice teaching and success in teaching as determined by pupil or supervisor ratings. Approximately 150 studies were cited in this review and less than six examined relationships between teacher presage variables and classroom behavior. None examined relationships between presage variables and differential teacher behavior.

Crocker (1974) conducted an extensive review of recent research involving the personal attributes of teachers. Examination of this review again reveals little presage-process research and no studies designed to investigate relationships between teacher characteristics and the differential treatment of students. Studies were concerned with (1) identifying personality and attitudinal differences among teachers on the basis of sex, grade level taught, type of teacher training received, etc.; (2) identifying personality and attitudinal differences between teachers and other members of the adult populations; and (3) relating personality characteristics to practice teaching scores and teacher effectiveness as determined by supervisor ratings.

Most studies, examining relationships between teacher presage variables and teacher classroom behavior, were part of the six-year Ryans Teacher Characteristics Study (1960) and were thus concerned with rather general teacher behaviors. The founders of this investigation

were responding to the irrelevant and contradictory findings of presage-product research. They argued that, because of wide variations in value positions regarding the concept of good teaching and differences in teacher role depending upon context, the educational enterprise would best be served by research which concentrated on the identification of characteristics that typify teacher behavior (Ryans, 1960, p. 371). The Teacher Characteristics Study had three major objectives:

> Objective I: The identification and analysis of some of the patterns of classroom behavior, attitudes, viewpoints, and intellectual and emotional qualities which may characterize teachers...
> Objective II: The development of paper-and-pencil instruments suitable for the estimation of certain patterns of classroom behavior and personal qualities of teachers...
> Objective III: The comparison of characteristics of various groups of teachers. (pp. 9 - 10)

Much of the Ryans research, therefore, was concerned with mere description of teacher characteristics and classroom behavior patterns. A few studies, however, explored presage-process relationships. Typical of these studies was research by McGee (1955). McGee investigated classroom manifestations of teacher authoritarianism. Authoritarianism was measured by the California F Scale and a classroom rating scale was used to record teacher behavior. The rating scale was designed to reveal "evidence of the deep, often unconscious forces which are thought of as going to make up the authoritarian syndrome" (p. 108). The sample was comprised of 150 elementary and secondary school teachers. The major finding of the study was a highly significant (.005 level) correlation between F Scale scores and assigned behavior scores. McGee concluded that "teachers classroom behavior on an Authoritarian - Equalitarian dimension can be predicted with fair accuracy from scores on the F Scale" (p. 144).

Although the Teacher Characteristics Study did much to describe the personal and behavioral attributes of teachers, it did little to identify meaningful relationships between teacher characteristics and either general or differential teacher classroom behavior.

A few studies have examined relationships between teacher characteristics and less divergent teacher classroom behaviors. Among the more important of these were a series of investigations by O. J. Harvey and colleagues. Harvey, Prather, White, and Alder (1966) engaged in research designed to examine relationships between teacher belief systems and teacher classroom behavior. Belief systems were identified through the use of a projective test (This I Believe Test). The This I Believe Test categorized teachers as belonging to one of four belief systems ranging from most concrete to most abstract. Teacher behavior was measured by a 26 dimension observation rating scale. The subjects were 168 teachers participating in a Head Start program. Subjects were observed for 2 1/2 hours per day on two occasions by two observers. Correlational analysis revealed that the most abstract teachers differed from the most concrete teachers, in what was presumed to be an educationally desirable direction, on all 26 dimensions of classroom behavior. Fourteen dimensions revealed statistically significant differences. Some of the major findings were:

> [Abstract teachers] expressed greater warmth toward the children, showed greater perceptiveness of the children's wishes and needs, were more flexible in meeting the needs and interests of the children, maintained more relaxed relationships with children, were more encouraging of individual responsibility, ... invoked unexplained rules less frequently, ... were less punitive. (p. 379)

These findings were replicated in studies by Harvey, Prather, White and

Hoffmeister (1968) and Coates, Harvey, and White (1970).

Finally, one study has examined relationships between teacher characteristics and the differential treatment of pupils. In research designed to examine the effect of teacher expectations on teacher behavior toward black and white children, Rubovits and Maehr (1971) studied the interaction of teacher dogmatism. Subjects were 104 sixth and seventh grade pupils and 26 undergraduate teachers working in micro-teaching situations. The Rokeach Dogmatism Scale was administered and teachers classified as high or low on dogmatism. Dogmatism was found to be related to differential treatment on the basis of race. Teachers high on dogmatism tended to encourage white pupils and ignore blacks. No relationships were discovered between level of dogmatism and behavior toward pupils on the basis of teacher expectations.

## Discussion

Research involving teacher presage variables has been of three types:

1. Descriptive - comparative research. These studies describe teachers, compare groups within the profession, and compare teachers to the rest of the adult population. Although informative, such research provides little information bearing on the teaching-learning process.

2. Presage-product research. These studies represent attempts to identify the characteristics of effective teachers. Findings have been largely inconsistent or inconsequential. Such studies have suffered from two major weaknesses. First, the majority have proceeded on the assumption that effective teachers are always, in all situations and with all students, effective teachers. Second, most attempts to establish

presage-product relationships have failed to examine what happens in the classroom. Such research, therefore, has failed to contribute to a better understanding of the teaching-learning process.

3. Presage-process research. Studies in this area have fared somewhat better. Although a number of studies have produced weak findings, others have contributed to a better understanding of teacher-pupil interaction and thus the teaching-learning process. Where findings have been weak, it seems the fault lies with procedures and variables investigated, rather than with the rationale underlying the research thrust.

The importance of presage variables in the teaching-learning process has been noted by a number of educators. Getzels and Jackson (1963) state:

> The personality of the teacher is a significant variable in the classroom.. Indeed some would argue it is the most significant variable. The educational impact of an Ichabod Crane or a Mark Hopkins, or a Mr. Chips or a Socrates, is surely not due solely to what he knows, but in a very real sense to what he is. (p. 506)

Bowers and Soar (1962) suggest:

> [Teacher] personality traits condition, modulate, promote certain responses from pupils... They are basic to teachers and pupils working together... in some quest for knowledge, skills, understanding and attitudes. (p. 309)

It would seem totally inadequate to consider the nature of classroom interaction independent of the characteristics the teacher brings to the classroom.

## SUMMARY

This chapter reviewed the literature pertinent to the study. In the first section, research involving experimentally induced expectations was examined. Experimental studies using product measures as dependent

variables have generally failed to produce evidence of expectation effects. Experimental studies using process measures as dependent variables have generally provided evidence indicating the existence of expectation effects. The second section reviewed research involving naturally formed teacher expectations. Most naturalistic research has examined relationships between expectations and the nature of teacher-pupil interaction. The findings of this body of research indicate that some teachers exhibit differential behavior toward children for whom they hold different performance expectations. The few naturalistic studies which used product measures as dependent variables suggest that teacher expectations can influence pupil achievement. In the third section, research involving teacher presage variables was reviewed. It was noted that very few studies have focused on relationships between teacher characteristics and observed classroom behavior. Chapter 3 describes the methods and procedures followed in the study.

# Chapter 3

## METHOD AND PROCEDURES

The major purpose of the study was to investigate relationships between differential teacher expectations and the nature of teacher-pupil interaction. A secondary purpose was to provide initial investigation into the antecedents of process expectation effects. This chapter will describe procedures followed in the study. It is presented in four sections: (1) sample, (2) data sources, (3) data collection, and (4) analysis.

## SAMPLE

The size and nature of the sample was influenced by a number of factors. They were: (1) the research philosophy underlying the larger project of which the present study was part, (2) advice received from researchers involved in similar investigations (classroom observation research), and (3) the willingness of classroom teachers to participate in the project.

The design of the larger research project necessitated that extensive data be collected as a basis for intensive examination of factors influencing the teaching-learning process. Knowledgeable researchers (Schulman, 1975; Brophy, 1976) advised that the nature of the study dictated a small research sample. These factors, when viewed within the framework of time, money, and manpower constraints led to a decision to use a sample of six teachers. The original intent was to

randomly select a grade one, grade three, and grade six classroom in each of two schools serving communities of differing socio-economic levels.

Permission was obtained to approach schools in three Alberta school jurisdictions. Presentations outlining the general purpose of the project were made to teachers in six schools (see Appendix A for prepared handout). Although reactions were generally favorable, and sometimes enthusiastic, few teachers volunteered to participate. A number of teachers who showed interest in the project explained that the time of year (late spring) was inappropriate. Many had supervised student teachers and expressed a need to be alone with their students for the balance of the year ("I just want to complete the year with my class - uninterrupted"). Others were heavily involved with extra-curricular activities and did not wish to assume additional responsibility. The investigators hypothesized that, while many teachers declined on the basis of the above reasons, others refused because of the nature of the study. Subjecting themselves to extensive in-class observation, some videotaping of lessons, and intensive interview sessions was simply too threatening.

The last two schools visited were chosen as the sample for the study. They were chosen because they were the first schools in which teachers at the appropriate grade levels agreed to participate. The characteristics of the sample were:

1. Schools. The schools were located several miles apart in an urban Alberta center. They were under the jurisdiction of the same school authority and served children in the kindergarten to grade six age range. They were approximately the same size with student enrolments of

450 - 530.

2. Teachers. The characteristics of the six teachers are presented in Table 2. In subsequent reference to teachers an attempt will be made to disguise the identity of individuals. Discussion will not follow the order of identification in Table 2. Also, all teachers will be referred to as female This procedure is necessary because anonymity was guaranteed.

Table 2

Distribution of Teachers by Grade, Sex, Age, Education and Experience

| Teachers by grade | Sex | Age | Degree held | Years of experience |
|---|---|---|---|---|
| 1 | F | 40 | BEd. | 17 |
| 1 | F | 34 | BEd. | 12 |
| 3 | F | 23 | BEd. | 1 |
| 3 | F | 25 | BEd. | 5 |
| 6 | M | 32 | BEd. | 5 |
| 6 | F | 41 | BEd. | 19 |

3. Students. The original student sample consisted of 160 individuals. It was necessary to exclude three students because absenteeism resulted in little or no observational data. The characteristics of the final sample are presented in Table 3.

## DATA SOURCES

The purposes of the study necessitated that three classes of data

be collected. They were: (1) process data (teacher-pupil interaction), (2) teacher expectation data (teacher expectations for individual pupil performance), and (3) presage data (teacher characteristics).

Table 3

Distribution of Students by Grade and Sex

| Grade | Boys | Girls | Total |
|---|---|---|---|
| 1 | 14 | 13 | 27 |
| 1 | 11 | 10 | 21 |
| 3 | 12 | 19 | 31 |
| 3 | 13 | 15 | 28 |
| 6 | 19 | 6 | 25 |
| 6 | 12 | 13 | 25 |
| Totals | 81 | 76 | 157 |

Process Data

The source of classroom interaction data was the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Observation System. This is a comprehensive low inference observation system developed by Brophy and Good (1969) and refined by Brophy and Evertson (1973). It was designed to capture the naturally occurring sequences of teacher-pupil interaction in elementary classrooms, as well as every interaction between the teacher and individual students. In addition, the instrument takes into account contextual differences and is based on real and psychologically meaningful units of classroom interaction (Brophy and Good, 1969, 1970;

Brophy and Evertson, 1973). The authors report that it is possible to train coders to reach an 80 percent agreement criterion using a strict definition of agreement. An outline of the system is presented in Appendix B, Section 1.

A large number of interaction variables can be derived from raw data collected with this system. The variables are of two types: (1) frequency measures which reflect quantitative aspects of teacher-pupil interaction, and (2) percentage measures which reflect the qualitative aspects of interaction. Frequency variables, such as number of academic response opportunities, have only limited value in providing insights into the nature of classroom interaction. While such measures reveal differences in the amount of dyadic contact experienced by pupils, they do not indicate whether such differences are attributable to preferential treatment by the teacher or objective differences in the pupils. Percentage variables are considerably more versatile. Brophy and Good (1972) state:

> Most of the important inferences about the nature of teacher-child interaction, especially about the communication of performance expectations by teachers, come from the percentage data and not from the frequency scores. (p. 98)

The basic advantage of percentage measures is that they make possible comparisons of pupils or groups of pupils even when differences exist in frequency of interaction. For example, pupils may be compared on the variable percent of questions answered correctly (correct answers /academic response opportunities). The pupil who answered 20 questions correctly out of a total 80 response opportunities receives the same score (.25) as the pupil who answered 10 questions correctly out of a total 40 response opportunities. A further advantage of percentage variables is that they permit comparisons of teacher behavior toward

pupils or groups of pupils in equivalent situations. For example, high achieving pupils would be expected to make more correct responses and fewer incorrect responses than low achieving pupils. Therefore, they would be expected, by virtue of simple opportunity, to get more teacher praise and less teacher criticism. Variables such as percent of correct answers praised, percent of incorrect answers cirticized, and percent of incorrect answers given sustaining feedback permit more meaningful comparisons than simple frequency variables, such as number of times praised, number of times criticized, and number of times given sustaining feedback.

Teacher Expectation Data

Expectation data were obtained through interview techniques. The protocols developed require teachers to: (1) rank pupils according to how well they are expected to achieve in school, (2) rate pupils according to both academic ability (very bright, bright, average ability, below average ability, dull) and usual attitude toward classroom activity (enthusiastic, interested, passive, uninterested, resistant), and (3) pr de reasons why children are placed in particular rank or rating categories. The latter task is facilitated by a specific request to describe the characteristics of those pupils receiving the three highest and three lowest expectation rankings, encouraging teachers to "think out " as they make decisions concerning ranks and ratings to be assigned, and the inclusion of a "comments" category on rating forms.

These protocols were somewhat more detailed than those normally used in research involving naturally formed teacher expectations. It was felt that more detailed information would provide valuable insights into

the meaning of teacher expectation rankings. Interview protocols are presented in Appendix C.

Presage Data

Data concerning teacher conceptual level, teacher attitude toward pupils, and teacher personality characteristics were obtained through the use of three standardized tests. These tests were: (1) the This I Believe (TIB) Test, (2) the Minnesota Teacher Attitude Inventory (MTAI), and (3) the Sixteen Personality Factor Questionnaire (16 PF).

This I Believe (TIB) Test. This test was developed for the purpose of classifying individuals according to belief systems ranging from concrete to abstract (Harvey, 1966). Subjects respond to a number of socially and personally based referents by comp ing the statement, "This I believe about _____." The developer claims that, from the degree of absolutism, tautologicalness, novelty, evaluativeness, and simplicity-complexity of the completions, respondents may be classified as belonging to one of four principal belief systems (p. 374). Descriptions of the four belief systems are presented in Appendix D, Section I. The instrument also yields scores on seven auxiliary dimensions. These dimensions are described in Appendix D, Section II. Harvey (1975) reports:

> The TIB test has been used in well over 100 studies by us and others in this country and abroad and has been found to yeild consistently valid outcomes. When scored by trained readers, it has been found to have an interjudge reliablity of .91. (p. 1)

Harvey (1970) contends that teachers' beliefs strongly influence the manner in which they interact with children. Examination of Harvey's belief categories and auxiliary dimensions reveal that such character-

istics as accuracy and flexibility of perception, degree of evaluativeness with pejorative implications, tendency towards defensiveness, and degree of openness are basic to this theory of belief orientation. Such a concept would appear to be valuable in the exploration of teacher differential behavior. The utility of teacher belief systems, as measured by the TIB test, is further indicated by research previously cited in which belief systems were consistently found to be related to ratings of teacher behavior.

Minnesota Teacher Attitude Inventory (MTAI). The MTAI was designed to

> measure those attitudes of a teacher which predict how well he will get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation. (Cook, Leeds, and Callis, 1951, p. 3)

There has been frequent analysis, reanalysis, and criticism of the MTAI since its development. It appears that criticism is based largely on the fact that developers and subsequent users have advocated its use in teacher selection and guidance, and its validity for that purpose has not been established. For purposes of measuring those attitudes which predict success in establishing rapport with students, the instrument has impressive validity. Cronbach, in a review of the instrument in the Fourth Mental Measurements Yearbook (Buros, 1953) reports that validity coefficients of .60, .63, and .46 have been found in three separate studies. In each study criterion measures were principal rating, pupil rating, and visiting expert rating. He refers to these validation studies as follows: "in design, replication, and care in reporting, these studies are distinguished" (p. 798). Cronbach also reports split-half reliability to be .93. The only test-retest data was obtained with

teachers in their first few months of experience. It was reported at .70. He suggests that test-retest results should be expected to fluctuate during early years but be high with experienced teachers "whose attitudes have become stablized" (p. 798).

In the present study, the MTAI is used as an indicant of teacher attitudes toward pupils which might influence their classroom behavior. It is not assumed that scores indicate any measure of overall teacher effectiveness.

Sixteen Personality Factor Questionnaire (16 PF). The 16 PF was developed by R. B. Cattell for the purpose of providing "the most complete coverage of personality possible in a brief time" (Cattell, 1972, p. 5). The instrument purports to measure "sixteen functionally independent and psychologically meaningful dimensions [of personality]" (p. 5).

Although the 16 PF, like other personality measures, has received some cirticism, it is generally held to be one of the best measures of personality presently available. Adcock (1959) states: "This test is undoubtedly a major development in the personality area... [it] bids fair to become the standard questionnaire-type personality test of the future" (pp. 196 - 199). Lorr (1965) reports that "it appears to be the best factor based personality inventory available" (p. 368). And Rorer (1972) concludes: "In conception and design, the 16 PF is unique, and a priori may well be the best personality inventory there is" (p. 333).

One of the major criticisms of the questionnaire has resulted from low correlations found between items within factors, i.e., low item homogeneity (Levonian, 1961). This criticism was answered by Cattell (1970):

> Many completely fallacious statements have been and are still made which imply that high homogeneity is a desirable feature of a test - that is, in fact, its "reliability"... If one wishes to create high homogeneities (and call them reliabilities!) ... it is easily possible to do so by multiplying the writing of very similar items. But any broad and important personality trait has to be assessed across a wide variety of areas and forms of expression. Furthermore, even from a purely psychometric point of view, the highest multiple-R validity is obtained by finding items which correlate consistently with the factor, but trivially with one another. (p. 32)

The 16 PF Manual reports test-retest reliability coefficients over short (dependability) and long (stability) periods. Dependability coefficients range from .65 to .93 with 80 percent about .80. Stability coefficients range from .63 to .88 with 90 percent above .70 (Cattell, 1972, p. 10). Construct validity is claimed for the questionnaire on the basis of extensive theoretical investigation and thirty years of factorial study. The Manual reports validity coefficients ranging from .53 to .94 with 70 percent over .70 (Cattell, 1972, p. 12). All coefficients are based on combined administration of Forms A and B of the questionnaire. Administration of combined forms has been found to provide substantial increases in both reliability and validity. This procedure was followed in the present study. Descriptions of the 16 primary and four second-order factors used in the study are presented in Appendix E.

## PROCEDURES

There were three distinct phases in the research project. The first, or preparatory phase, was devoted to the devlopment of teacher interview protocols and the training of researchers in the use of the observation system to be employed in the study. The second was a familiarization period when researchers spent time in the classrooms to

be used in the study. The third phase involved the actual collection of data.

Preparatory Phase

The major task of the preparatory phase was training in the use of the Brophy-Good classroom observation system. This training involved three coders and occupied a large portion of the three-week preparatory period. The manual developed by the authors was used and general recommendations for training received in personal communication with J. Brophy were adopted. Three classrooms representing grades 1, 2, and 5 were used for training purposes.

Initially some time was spent in discussing system categories and in practice coding from transcripts of lessons. Toward the end of the first week of training, live coding was commenced. The procedure adopted involved spending short periods in the classrooms and then retiring to compare results with the aid of an audiotape of the lesson.

One major difficulty was encountered during the training period and it persisted even as coding skills increased. The problem stemmed from the fact that coders missed slices of classroom interaction while recording observations on coding sheets. The problem was exacerbated as the pace of classroom life increased. Coders found that the task of recording observations interfered with efforts to capture the flow of classroom events. The problem was resolved by a decision to record all coded observations on audiotape as they occurred. Coders could thus keep their eyes consistently on events in the classroom and, at the same time, record coded classroom interactions.

This technique was used as unobtrusively as possible. It

received no adverse comment from any teacher in either the school used for training purposes or those used in the research project itself. The procedure provided an additional bonus for training. Portions of classroom discourse were also recorded and provided opportunities for verification of live coding.

Two minor modifications were made to the system during the training period. The changes were made because it was considered that they facilitated more accurate description of the ways teachers provided feedback to pupils in academic response opportunities. To the ten categories of teacher feedback reaction in academic response opportunities, two more were added:

1. affirmative teacher reaction (AFFIRM);
2. repeats student statement (REP SS).

These changes were affected by dividing the no feedback reaction category into two parts and adding a new category to the sustaining response section of the system (see Appendix B, Section II).

Intercoder reliability during training. Reliability was calculated using a formula proposed by Brophy and Evertson (1973) which they claim is more stringent than methods normally used. The formula is:

> Percentage agreement equals number of coding decisions made by both coders and agreed upon divided by itself plus number of coding decisions not agreed upon plus the number of codings made by the first coder but not the second plus number of codings made by the second coder but not the first.

An 80 percent agreement criterion was sought and frequently achieved. In some situations, however, the desired level was not

obtained. The main factor contributing to this failure was one also noted by Brophy and Evertson (1973). Specifically, it was the "difficulty of 'catching everything' during bursts of activity" (p. 11). The reliability measures tabled in Appendix F compare favorably with those reported by Brophy and Evertson who regarded their results as generally satisfactory. They noted that many of their results were lower than 80 percent but regarded most as satisfactorily high, given the demanding agreement criterion.

Many of the results appearing in Appendix F are spuriously high (or low) because of the extremely low frequency of occurrence of some behaviors. For example, if a behavior occurs once only in a lesson and is coded by both observers, 100 percent agreement results. On the other hand, if one coder doesn't see the event then percentage agreement is zero. For this reason, only percentage agreement results for categories with a frequency of occurrence of more than 10 are listed in Table 4 as examples of reliability measures achieved during training.

Development of teacher interview protocols. Interview protocols to be used for obtaining teacher expectation data were also developed during the preparatory phase. A first draft was constructed from information available in research literature (Brophy and Good, 1970, 1974). Two teachers in the training school were requested to rank their pupils according to expected achievement. Upon completion of the task they were asked to indicate problems encountered and to comment on the extent to which the product clearly described the expectations which they held for individual pupil performance. Discussions led to the development of a second draft of the protocols in which teacher

Table 4

Intercoder Reliability Measures Obtained with the Low Inference Classroom Observation System during Training

| Variable | % Reliability for Pairs of Coders (N=3) | Mean |
|---|---|---|
| Acad. resp. opportunity | | |
| Type of respondent | 82,80,82 | 81.3 |
| Question type | 73,30,36 | 46.3 |
| Child answer | 85,64,69 | 72.7 |
| Teacher feedback | 43,60,60 | 54.3 |
| Private dyadic contact | | |
| Type (CCC vs. TAC) | 65,86,84,92,76,92 | 82.5 |
| Child created contact | | |
| Type | 90,83,96,79,87,95 | 88.3 |
| Child created contact (wk.-rel.) | | |
| Teacher feedback (delay, brief, long) | 79,86,79,78,100,88 | 85.0 |
| Teacher afforded contact (wk.-rel.) | | |
| Teacher feedback (delay, brief, long) | 31,59,32 | 40.7 |
| Teacher feedback ($^{+}_{+}$, $^{-}_{-}$) | 33,100,33 | 55.3 |

suggestions were incorporated. This draft was used as the basis for an interview with a third teacher. As before, the task was followed by discussion in which teacher reaction was solicited. Since reaction was generally favorable and no further suggestions were made, the protocols were adopted for use in the study. The protocols were described earlier in the chapter and are presented in Appendix C.

Familiarization Phase

A familiarization period of one week was spent in the classrooms of the six teachers participating in the study. Each researcher spent alternate days in the two classrooms in which he would eventually be collecting observational data. During that time, each researcher engaged in a number of pre-planned activities:

1. He arranged with the teachers to be introduced, or to introduce himself, as a visitor to the classroom with an interest in schools and classrooms. Every effort was made to ensure that students did not identify members of the research group with the authority structures of the schoolboard, school, or classroom.

2. He familiarized himself with classroom routine.

3. He memorized the names of the students in both grades. This was a prerequisite for the intended use of the classroom observation system.

4. He practised using the classroom observation system.

5. He arranged to carry out teacher interviews and to collect teacher presage data (16 PF, MTAI, TIB) at times suitable to teachers and schools.

Data Collection Phase

Process data. Three investigators were involved in the collection of teacher-pupil interaction data. Each was assigned to two classrooms. One investigator was assigned to both grade one classes, another to both grade three classes, and the third to both grade six classes.

Except in the case of one grade six class, all interaction data were collected in the two weeks immediately following the familiarization period. Because of the teacher's absence, it was necessary to collect data in this classroom during the first and third weeks following familiarization. Five days were spent in each classroom over the two week period. Normally, data were collected by each investigator spending alternate days in the two classrooms for which he was responsible. This routine was altered in one classroom to accommodate the teacher's absence.

Data collection was restricted to lessons in Language Arts and Mathematics at the first and third grade levels, and to Language Arts lessons in grade six. Mathematics lessons were not observed in grade six because departmentalization resulted in different teachers for the two subjects.

Time spent in observation in the two subject areas (grades one and three) reflected the ratio of times allocated to Language Arts and Mathematics in the class timetable, approximately 3:1 respectively. The original intent was to collect interaction data in both morning and afternoon sessions. This, however, was not always possible. In some classes Mathematics was taught only in the morning and in both grade six classes Language Arts teaching was limited to the morning. Table 5 shows how periods of coded observation were spread over sessions and subject area in each of the six classrooms.

Table 5

Distribution of Actual Observation Periods[a] for Collection of Interaction Data Across Grade, Session, and Subject

| Subject | Language Arts | | | | Mathematics | | | |
|---|---|---|---|---|---|---|---|---|
| Time | A.M. | | P.M. | | A.M. | | P.M. | |
| Session[b] | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
| School 1 Grade 1 | 3 | 8 | 1 | | | | 3 | |
| 3 | 6 | 4 | | | | | 4 | |
| 6 | 7 | 5 | | | | | | |
| School 2 Grade 1 | 5 | 7 | | | | | 3 | |
| 3 | | 6 | 6 | | 3 | | | |
| 6 | 6 | 6 | | | | | | |

[a]A period of observation is a half hour.

[b]Each day in both schools consists of four sessions: $S_1$ 8:40 a.m. - 9:50 a.m.; $S_2$ 10:05 a.m. - 11:15 a.m.; $S_3$ 12:35 p.m. - 1:45 p.m.; $S_4$ 2:00 p.m. - 3:10 p.m.

Intercoder reliability during data collection. Coders were trained to criterion level prior to data collection and, therefore, coded alone during the study proper. Because of the difficulty in achieving 80 percent agreement in all categories during training, it was deemed advisable to carry out reliability checks on each coder during data collection.

Intercoder reliability checks were conducted in each classroom on occasions spanning the two week period of data collection. An effort was made to do a reliability check in each classroom with the home room coder paired first with one of the two remaining coders and then with the other. This was achieved in four of the six classrooms. Thirteen

separate checks were made with at least one check made in each classroom. These measures of intercoder reliability are reported in Appendix G. The same strict definition of agreement was used as discussed earlier. Only percentages of agreement for variables with frequencies over 10 are reported in Table 6 for reasons stated earlier. These results indicate a satisfactorily high level of agreement.

Expectation and presage data. Three investigators were involved in the collection of expectation data. Standard interview protocols were used and each investigator interviewed those teachers with whom he had been associated during the classroom observation phase of the study. Interviews were conducted upon completion of the observation phase to ensure that teachers would not modify classroom behavior on the basis of assumptions made concerning the purpose of the research. Interviews were audio recorded and subsequently transcribed for analysis.

Presage data were collected by one of the investigators in the larger research project. The three standardized tests (MTAI, TIB, 16 PF) were administered upon completion of the classroom observation period. The test were appropriately spaced to prevent teacher fatigue and care was taken to follow procedures outlined in the test manuals. Substitute teachers were employed to replace project teachers in the classroom for the time required to administer the tests.

## ANALYSIS

### Data Preparation

Previous to analyzing the data, certain preparatory activities were carried out. These activities are described below.

Table 6

Intercoder Reliability Measures Obtained with the Low Inference System during Data Collection

| Variable | % Reliability Measures for Pairs of Coders | Mean |
|---|---|---|
| Acad. resp. opportunity | | |
| Type of respondent | 85,91,71,50,79 | 75.2 |
| Question type | 88,86,77,89,82,55,83 | 80.0 |
| Child answer | 85,90,75,52,89 | 78.2 |
| Teacher feedback | 73,76,69,66,74 | 71.6 |
| Student initiated question | | |
| Teacher feedback | 60 | |
| Student initiated comment | | |
| Type | 50.71 | 60.5 |
| Relevancy | 44,75 | 59.5 |
| Teacher feedback | 44,57 | 55.5 |
| Private dyadic contact | | |
| Type (CCC vs. TAC) | 84,73,73,56,83,89, 56,85,88,83 | 77.0 |
| Child created contact (wk.-rel.) | | |
| Type | 62,69,80,81,80 | 74.4 |
| Teacher feedback | 41,71,75,79,67 | 66.6 |
| Teacher afforded contact (pers.-rel.) | | |
| Type | 76,74,67,43,85,77,90,55 | 70.9 |
| Teacher afforded contact (wk.-rel.) | | |
| Teacher feedback | 67,83 | 75.0 |
| Teacher afforded contact (proc.-rel.) | 50,100,89,22,100,88 | 74.8 |

Process data (Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Observation System). Interaction variables appropriate to the study were identified and pupil scores on each variable calculated. This process involved a number of steps.

1. Raw data from the original coding sheets were summed, by pupil, for each of the 98 coding categories. These frequencies were transferred to IBM data cards in order to facil[redacted]puter assisted time standardization and calculation of [redacted]scores for individual pupils.

2. Scores on frequency [redacted]ere calculated directly from category frequencies. In some cases scores were simply the total of a particular coding category. For example, a pupil score on the variable number of process questions was his total in the coding category, process questions. Other frequency variable scores, however, required the summing of totals in a number of coding categories. For example, computing a pupil's score on the variable number of academic response opportunities necessitated combining totals in process, product and choice categories.

3. Frequency variables were adjusted in accordance with pupil attendance during coding periods. This procedure involved multiplying the frequency variable by the proportion of total observation time during which each pupil was present. For example, if a pupil was in attendance for 75 of 100 observation minutes, his score on each frequency variable was multiplied by 1.25. This procedure was considered appropriate since observations were spaced over a period of two weeks and it was concluded that there were few systematic differences in the nature of classroom activity between observation periods. If such differences were evident, it would be necessary to adjust frequencies

according to whether a particular type of activity was prevalent during the observation period when a particular pupil was absent.

4. Scores on percentage variables were calculated from pupil frequency variables. This was accomplished by standard arithmetic procedures. For example, a pupil score on the variable percent of correct answers receiving affirmation was computed by dividing number of correct answers receiving affirmation by his total number of correct answers.

A decision was made, during the preparatory activity, to exclude from the analysis that data collected in grade one and grade three Mathematics classes. The decision was based on preliminary examination of the data which revealed that very little interaction data was obtained for most children during Mathematics lessons. This situation resulted from the amount of time devoted to classroom observation and from the instructional style used by teachers.

Expectation data. In each class teachers ranked students according to how well they were expected to achieve in school. For purposes of this study, those ranked in the top one-third of the class were identified as high expectation students, and those ranked in the bottom one-third of the class were identified as low expectation students.

Presage data. The Sixteen Personality Factor Questionnaire (16 PF) was scored using scoring keys obtained from the publishers. Raw scores for the 16 primary factors were converted to sten scores using conversion tables based on norms for the general adult population (male + female: Form A + Form B; N= 1710) and published in the supplement to the Te Manual. Four secondary factor scores were calculated using

procedures described in the Test Manual.

The This I Believe (TIB) Test is a projective instrument and, therefore, must be scored by trained personnel. The completed tests were sent to J. J. Harvey and scored under his supervision. An overall belief system score and scores on five auxiliary dimensions were obtained for each teacher. Belief system scores are reported as 1, 2, 3, or 4. The most concrete belief system is System 1; the most abstract, System 4. Where traces of other systems are found it is indicated by a second number following a dash (e.g., 1 - 4 indicates a primarily concrete system with traces of system 4). Auxiliary dimensions are scored on a five point scale, 1 indicating the lowest score and 5 indicating the highest score.

The Minnesota Teacher Attitude Inventory (MTAI) was scored with official scoring keys purchased with the test. Raw scores were converted to percentile ranks using conversion tables based on norms for experienced teachers in systems with 21 or more teachers and having 4 years training. Norm tables are published in the Test Manual.

Data Analysis

The study required two stages of analysis. In the first stage, relationships between teacher expectations and the nature of teacher-pupil interaction were investigated. In the second stage, relationships between selected teacher characteristics and differential teacher behavior were investigated.

Teacher expectations and the nature of teacher-pupil interaction. This investigation utilized 33 interaction variables. The criteria for selecting variables were: (1) the nature of questions being investigated;

(2) past research examining relationships between teacher expectations and teacher-pupil interaction; and (3) the actual nature of interaction in the classrooms under investigation.

Two levels of analysis were used to study relationships. First, t ratios were calculated to determine whether mean differences between high and low expectancy groups were statistically significant. The ANOV 10 computer program (Division of Educational Research, University of Alberta) was used for this purpose*. The procedure was carried out for each of the six classrooms in the study. Second, individual pupil scores on each variable were recorded and calculations were made to determine the percent of total interaction obtained by high and low expectancy groups on frequency variables and the mean group percent on percentage variables. This procedure was followed in each of the six classrooms. Its purpose was to provide additional insight into the nature of group differences and the distribution of interaction across individual children in the study. It was felt that such an investigation might indicate trends not necessarily revealed through the t test analysis. Also, preliminary inspection of the data revealed that certain types of interaction did not occur with pupils in one or the other expectancy group. This situation would result in no variance in the group and, therefore, prohibit the calculation of t ratios. For example, if the high expectancy group was praised an average of six times

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*The program includes a test for homogeneity of variance and calculates Welch approximation of t ratios for those variables of unequal variance.

and low expectancy children received no praise, the zero variance in the low group would negate the possibility of calculating a t ratio.

The decision to use the above approach in investigating and reporting relationships was strongly influenced by the recommendations of Dunkin and Biddle (1974). These authors discuss, at length, the problems associated with carrying out observational research in classrooms. They emphasize the need for reporting descriptive information concerning the data collected. They state:

> Surely the error most often found in research on teaching is the substitution of inductive for descriptive statistics... [The] calculation of inductive statistics for data from classroom research is rarely justified... the real difficulty is that the reader needs to know the descriptive information, not the inductive, in order to assess the strength of a given finding. To know that a correlation or a mean difference is "statistically significant" does not tell us how large those relationships were found to be. And yet it is exactly the criterion of how large that should be used to ascertain whether a given finding is substantial or picayune. (p. 433)

Teacher characteristics and differential teacher behavior. Although research involving teacher presage variables has been abundant, few studies have investigated relationships between teacher characteristics and behavior toward children for whom differential expectations are held. This phase of the study, therefore, was exploratory in nature. It was intended as a first step toward a better understanding of the personal characteristics which make teachers susceptible to treating children differently on the basis of performance expectations. Its aim was to provide initial insights for theory building and leads for future research. For this reason, and those discussed in the previous section, descriptive procedures were used.

Teacher were classified according to extent and nature of

differential behavior. Scores were obtained on selected measures of personal attributes. The data were inspected in a search for prima facie evidence of relationships between teacher characteristics and teacher differential behavior.

## SUMMARY

This chapter described the procedures followed in the study. The description included detailed discussions of the selection and nature of the sample, the sources and methods of data collection, and the types of analysis applied to the data. Chapter 4 presents the findings of the study.

# Chapter 4

## RESULTS

The study had two purposes. The first, and major, purpose was to investigate relationships between differential teacher expectations and the nature of teacher-pupil interaction. The second purpose was to examine relationships between selected teacher characteristics and differential teacher behavior. A statement of research questions addressing each purpose was presented in Chapter 1.

In this chapter, the results of the investigation of each research question are reported and discussed in turn. The chapter, therefore, is presented in two sections: (1) teacher expectations and teacher-pupil interaction, and (2) teacher characteristics and differential teacher behavior.

## TEACHER EXPECTATIONS AND TEACHER-PUPIL INTERACTION

Relationships between teacher expectations and teacher-pupil interaction were investigated using 33 interaction variables derived from the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Observation System. The variables describe three dimensions of teacher-pupil interaction and were so grouped for purposes of presenting and discussing the data related to this phase of the study. The variables comprising each of the three groups are summarized in Figure 1 and discussed briefly below. A complete description of the interaction categories from which the variables are derived is presented in Brophy and Evertson (1973).

Figure 1

Teacher-Pupil Interaction Variables by Group

| Group | | Description |
|---|---|---|
| A. | Frequency and Type of Interaction | 1. Direct questions |
| | | 2. Process questions |
| | | 3. Product + choice questions |
| | | 4. Teacher initiated public work contacts |
| | | 5. Teacher initiated private work contacts |
| | | 6. Total teacher initiated work contacts |
| | | 7. Teacher initiated personal contacts |
| | | 8. Teacher initiated procedure contacts |
| | | 9. Teacher initiated behavior contacts |
| | | 10. Student call outs to teacher questions |
| | | 11. Student initiated public work contacts |
| | | 12. Student initiated private work contacts |
| | | 13. Total student initiated work contacts |
| | | 14. Student initiated personal contacts |
| | | 15. Total dyadic contacts |
| B. | Pupil Performance and Teacher Evaluation | 16. Correct answers |
| | | 17. Partly-correct answers |
| | | 18. Wrong answers |
| | | 19. Don't know and no response reactions |
| | | 20. Percent of questions answered correctly |
| | | 21. Academic praise |
| | | 22. Academic criticism |
| | | 23. Behavioral praise |
| | | 24. Behavioral criticism |
| C. | Teacher Reaction to Pupil Participation | 25. Percent of correct answers praised |
| | | 26. Percent of correct answers affirmed |
| | | 27. Percent of correct answers followed by a new question |
| | | 28. Percent of answers (correct or incorrect) receiving no feedback |
| | | 29. Percent of failures followed by process feedback |
| | | 30. Percent of failures followed by teacher giving correct answer |
| | | 31. Percent of failures followed by teacher asking another student |
| | | 32. Percent of failures followed by sustaining feedback |
| | | 33. Percent of sustaining feedback which is rephrased or new question |

The variables in Group A describe the frequency and type of teacher-pupil interaction. They include measures of both public and private interaction. Public interactions are those which occur in front of the entire class (e.g., teacher asks a question; pupil volunteers an unsolicited comment or question). Private interactions take place apart from the rest of the class, usually at the teacher's or pupil's desk. Public and private interactions may be either teacher initiated or student initiated. Teacher initiated refer to contacts which are under the control of the teacher, and student initiated refer to those that result from the pupil volunteering comments or questions or seeking out the teacher for individual attention. These interactions are further subdivided into work-related, personal-related, procedure-related, and behavior-related. Personal-related contacts usually involve discussion about out-of-school experiences. For example, the teacher may ask the child about a co-curricular activity or the child may contact the teacher to relate an experience that occurred on the way to school. Procedure-related contacts are those which relate to management aspects of classroom activity. For example, the teacher may ask a pupil to pass out readers or change his seat. Behavior-related contacts result from pupil misbehavior.

Group B variables are those describing pupil performance and teacher evaluation of pupil performance. They are mostly frequency variables. They indicate the number of times pupils answer questions correctly and the number of times they provide a partly-correct response, a totally wrong response, reply that they do not know the answer, or simply make no response to a teacher question. The final measure of pupil performance, percent of questions answered correctly, equalizes

differences in the frequency with which pupils are called on to answer. Measures of the amount of teacher praise and criticism are used as indicators of teacher evaluation of pupil performance.

Group C variables are measures of the kinds of responses teachers make to pupil participation in the public life of the classroom. These measures are statistically controlled to compensate for differences in frequency of participation. Affirmation is teacher feedback which communicates that an answer is correct without praising the contribution of the child. Process feedback involves the teacher explaining the cognitive or behavioral processes that were necessary for arriving at the correct answer. Sustaining feedback occurs when the teacher gives the pupil a second chance to answer correctly. It may take the form of repeating the question, repeating the pupil's answer in a quizzical manner, rephrasing the question, or asking a new question.

Thus, the measures in Group A describe the frequency of teacher-pupil interaction, those in Group B the quality of pupil performance and the nature of teacher evaluation, and those in Group C the nature of teacher response to pupil participation. In general, Group A and Group B variables cannot be taken as evidence of teacher favoritism or the communication of performance expectations. Scores on these measures are susceptible to objective differences in pupils or reflect aspects of teacher-pupil interaction which cannot be unambiguously interpreted as due either to teacher favoritism or objective differences in pupils. Two possible exceptions are the frequency variables <u>number of direct questions</u> and <u>teacher initiated private work contact</u>. The former measure indicates the frequency with which the teacher specifically designates a child to answer a question. They occur when the child is

pre-selected before the question or is called upon when he does not volunteer. The latter measure indicates the number of times the teacher affords private individual attention on her own initiative. Group C variables, percent measures statistically controlled to reflect teacher reaction to pupils in equivalent situations, are generally considered to be the most reliable indicators of the communication of performance expectations.

The procedures followed in the analysis of data were described in Chapter 3. In reporting the findings of this phase of the study, reference will be made to both levels of analysis (i.e., descriptive and inductive). Following a restatement of the research questions, the findings are reported for each of the six classrooms under investigation.

Restatement of Research Questions:

1. Do teachers interact differently with pupils for whom they hold high performance expectations than with pupils for whom they hold low performance expectations? If so, what is the nature of such differential interaction?

More specifically:

a. Do differences exist in the frequency and type of teacher interaction with high and low expectancy children?

b. Do teachers respond to pupil participation in ways that indicate a systematic favoring (e.g., provide more encouragement; provide more direct opportunity to learn) of either high or low expectancy children?

Classroom 1

The data for Classroom 1 are presented in Tables 7 - 10. Table 7

reports the results of the t test analysis for all three categories of interaction variables. Five significant expectancy group differences were found. Most involved measures of student initiated interaction and all favored children for whom the teacher held high performance expectations. Highs initiated more public work contact ($P < .10$), more total work contact ($P < .10$), and more personal contact ($P < .05$) than did children in the low expectancy group. In addition, highs exceeded lows in number of teacher initiated procedure contacts ($P < .10$) and total interaction with the teacher ($P < .05$).

Individual pupil scores and group percentage totals on measures related to frequency of interaction are presented in Table 8. These data elaborate the findings in Table 7 and indicate a further trend with regard to teacher initiated interaction. They show some tendency for the teacher to initiate more public work contact with highs than with lows (highs accounted for 61 percent of the total). It is also of interest that little group difference was found in the number of direct questions asked by the teacher (highs accounted for 55 percent of the total).

Individual scores and group percentage totals on measures related to pupil performance and teacher evaluation of pupil performance are presented in Table 9. Very few observations were obtained on most variables in this category. The situation resulted from the teacher's disposition to ask relatively few open or direct questions and the tendency for children in both high and low expectancy groups to answer

Table 7

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 1)

| | Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|---|
| 1 | Direct questions | 2.83 | 2.21 | 1.78 | 1.64 | 1.1484 |
| 2 | Process questions | .22 | .00 | .00 | .00 | - |
| 3 | Product + choice questions | 4.08 | 2.52 | 2.58 | 1.79 | 1.4522 |
| 4 | T.I. public work contacts | 4.30 | 2.69 | 2.69 | 1.63 | 1.5306 |
| 5 | T.I. private work contacts | 14.22 | 1.72 | 14.38 | 3.24 | -0.1316 |
| 6 | Total T.I. work contacts | 18.52 | 2.94 | 17.07 | 3.89 | .8905 |
| 7 | T.I. personal contacts | .78 | 1.09 | .11 | .33 | 1.7504 |
| 8 | T.I. procedural contacts | 7.05 | 3.02 | 4.53 | 2.36 | 1.9778* |
| 9 | T.I. behavioral contacts | 4.82 | 3.48 | 2.58 | 1.79 | 1.7136 |
| 10 | Student call outs | .78 | .97 | .58 | .56 | .5236 |
| 11 | S.I. public work contacts | 3.46 | 3.52 | 1.33 | 1.66 | 1.6436* |
| 12 | S.I. private work contacts | 8.68 | 4.26 | 6.24 | 2.54 | 1.4721 |
| 13 | Total S.I. work contacts | 12.14 | 6.25 | 7.58 | 3.70 | 1.8835* |
| 14 | S.I. personal contacts | 2.79 | 1.81 | 1.00 | 1.00 | 2.5993** |
| 15 | Total dyadic contacts | 46.57 | 12.65 | 32.98 | 9.71 | 2.5566** |
| 16 | Correct answers | 3.61 | 2.50 | 1.92 | 1.60 | 1.7094 |
| 17 | Partly correct answers | .36 | - | .00 | .00 | - |
| 18 | Wrong answers | .11 | .33 | .33 | .50 | -1.1094 |
| 19 | DK & NR reactions | .00 | .00 | .00 | .00 | - |
| 20 | % questions answered correctly | 82.52 | 20.90 | 68.96 | 34.07 | 1.0024 |
| 21 | Academic praise | 2.19 | 2.95 | 3.50 | 2.48 | -1.0158 |
| 22 | Academic criticism | 1.05 | .71 | .72 | 1.20 | .7089 |
| 23 | Behavioral praise | .22 | .44 | .22 | .44 | .0000 |
| 24 | Behavioral criticism | .76 | 1.60 | .78 | 1.40 | -0.0240 |
| 25 | % correct answers praised | 1.59 | 4.76 | 17.14 | 37.29 | -1.2509 |
| 26 | % correct answers affirmed | 86.01 | 14.53 | 94.29 | 15.12 | -1.1114 |
| 27 | % new questions after correct ans. | 7.78 | - | .00 | .00 | - |
| 28 | % answer given no feedback | 7.54 | 9.52 | 13.70 | 20.98 | -0.8024 |
| 29 | % process feedback after failure | .00 | .00 | .00 | .00 | - |
| 30 | % gives answer after failure | 20.00 | 44.72 | 30.00 | 44.72 | -0.3356 |
| 31 | % asks another after failure | .00 | .00 | .00 | .00 | - |
| 32 | % failure sustained | 50.00 | 20.00 | 50.00 | 44.72 | 1.0000 |
| 33 | % sustain which is clue or NQ | 66.68 | - | 0.00 | 0.00 | - |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

*P < .10

**P < .05

Table 8

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction
(Classroom 1)

| Pupils by Expectation Rank | Interaction Variables: Teacher Initiated: Direct Questions (1) | Process Questions (2) | Product + Choice Questions (3) | T.I. Public Work Contacts (4) | T.I. Private Work Contacts (5) | Total T.I. Work Contacts (6) | T.I. Personal Contacts (7) | T.I. Procedure Contacts (8) | T.I. Behavioral Contacts (9) | Student Call Outs (10) | Student Initiated: S.I. Public Work Contacts (11) | S.I. Private Work Contacts (12) | Total S.I. Work Contacts (13) | S.I. Personal Contacts (14) | Total Dyadic Contacts (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2.48 | 0.00 | 2.49 | 2.49 | 14.92 | 17.41 | 0.00 | 9.95 | 2.49 | 0.00 | 3.73 | 2.49 | 6.22 | 2.49 | 38.54 |
| 2 | 6.00 | .00 | 7.00 | 7.00 | 13.00 | 20.00 | 3.00 | 5.00 | 4.00 | .00 | 4.00 | 8.00 | 12.00 | 3.00 | 47.00 |
| 3 | 4.00 | .00 | 7.00 | 7.00 | 15.00 | 22.00 | .00 | 12.00 | 4.00 | 1.00 | 3.00 | 14.00 | 17.00 | 3.00 | 58.00 |
| 4 | .00 | .00 | 1.22 | 1.22 | 17.06 | 18.28 | .00 | 8.53 | 4.87 | .00 | 2.44 | 14.62 | 17.06 | 3.66 | 53.62 |
| 5 | 2.00 | .00 | 7.00 | 7.00 | 14.00 | 21.00 | 1.00 | 4.00 | 7.00 | 3.00 | 12.00 | 11.00 | 23.00 | 5.00 | 61.00 |
| 6 | .00 | .00 | 1.00 | 1.00 | 11.00 | 12.00 | .00 | 3.00 | 1.00 | 1.00 | 1.00 | 4.00 | 5.00 | .00 | 21.00 |
| 7 | .00 | 0.00 | 5.00 | 7.00 | 13.00 | 20.00 | 1.00 | 5.00 | 4.00 | 1.00 | 1.00 | 6.00 | 7.00 | 5.00 | 44.00 |
| 8 | 3.00 | 0 | 4.00 | 4.00 | 15.00 | 19.00 | .00 | 7.00 | 13.00 | 1.00 | 4.00 | 11.00 | 15.00 | 3.00 | 57.00 |
| 9 | 2.00 | .00 | 2.00 | 2.00 | 15.00 | 17.00 | 2.00 | 9.00 | 3.00 | .00 | .00 | 7.00 | 7.00 | .00 | 39.00 |
| 19 | .00 | .00 | 1.24 | 1.24 | 12.43 | 13.67 | .00 | 3.73 | 1.24 | 1.24 | .00 | 6.22 | 6.22 | .00 | 24.86 |
| 20 | 2.00 | .00 | 3.00 | 3.00 | 18.00 | 21.00 | 1.00 | 9.00 | 6.00 | 1.00 | 5.00 | 12.00 | 17.00 | .00 | 54.00 |
| 21 | 3.00 | .00 | 5.00 | 5.00 | 10.00 | 15.00 | .00 | 3.00 | 2.00 | .00 | .00 | 7.00 | 7.00 | 2.00 | 29.00 |
| 22 | 5.00 | .00 | 5.00 | 5.00 | 19.00 | 24.00 | .00 | 7.00 | 4.00 | .00 | 2.00 | 3.00 | 5.00 | 2.00 | 42.00 |
| 23 | 3.00 | .00 | 4.00 | 4.00 | 13.00 | 17.00 | .00 | 4.00 | 2.00 | 1.00 | 2.00 | 7.00 | 9.00 | 2.00 | 34.00 |
| 24 | 1.00 | .00 | 2.00 | 2.00 | 18.00 | 20.00 | .00 | 4.00 | 2.00 | 1.00 | .00 | 6.00 | 6.00 | 1.00 | 35.00 |
| 25 | .00 | .00 | 1.00 | 1.00 | 12.00 | 13.00 | .00 | 6.00 | 4.00 | .00 | 1.00 | 5.00 | 6.00 | 2.00 | 31.00 |
| 26 | 1.00 | .00 | 2.00 | 2.00 | 15.00 | 17.00 | .00 | 2.00 | .00 | 1.00 | 2.00 | 4.00 | 6.00 | .00 | 25.00 |
| 27 | 1.00 | 0.00 | 1.00 | 1.00 | 12.00 | 13.00 | 0.00 | 2.00 | 2.00 | 0.00 | 0.00 | 6.00 | 6.00 | 0.00 | 24.00 |
| % of Total (Highs) | 54.90 | 100.00 | 60.23 | 61.49 | 49.72 | 52.03 | 87.50 | 60.92 | 65.11 | 57.19 | 72.20 | 58.15 | 61.57 | 68.60 | 58.38 |
| % of Total (Lows) | 45.10 | 0.00 | 39.77 | 38.51 | 50.28 | 47.97 | 12.50 | 39.09 | 34.90 | 42.81 | 27.80 | 41.85 | 38.43 | 31.40 | 41.62 |

Table 9

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 1)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 1.24 | 1.24 | 0.00 | 0.00 | 50.00 | 0.00 | 1.24 | 0.00 | 0.00 |
| 2 | 6.00 | .00 | .00 | .00 | 86.00 | 2.00 | 1.00 | 00 | .00 |
| 3 | 6.00 | 1.00 | .00 | .00 | 86.00 | 2.00 | .00 | 00 | .00 |
| 4 | 1.22 | .00 | .00 | .00 | 100.00 | 9.75 | 1.22 | .00 | 4.87 |
| 5 | 7.00 | .00 | .00 | .00 | 100.00 | 2.00 | .00 | .00 | .00 |
| 6 | 1.00 | .00 | .00 | .00 | 100.00 | .00 | 1.00 | .00 | .00 |
| 7 | 5.00 | .00 | 1.00 | .00 | 71.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| 8 | 4.00 | .00 | .00 | .00 | 100.00 | 1.00 | 2.00 | .00 | .00 |
| 9 | 1.00 | 1.00 | .00 | .00 | 50.00 | 1.00 | 2.00 | .00 | 1.00 |
| 19 | 1.24 | .00 | .00 | .00 | 100.00 | 2.49 | 2.49 | .00 | .00 |
| 20 | 2.00 | .00 | .00 | .00 | 67.00 | 2.00 | .00 | .00 | 4.00 |
| 21 | 5.00 | .00 | .00 | .00 | 100.00 | 4.00 | .00 | .00 | .00 |
| 22 | 3.00 | .00 | .00 | .00 | 60.00 | 8.00 | .00 | .00 | 1.00 |
| 23 | 3.00 | .00 | 1.00 | .00 | 75.00 | 1.00 | .00 | 1.00 | .00 |
| 24 | 1.00 | .00 | 1.00 | .00 | 50.00 | 6.00 | .00 | .00 | .00 |
| 25 | .00 | .00 | .00 | .00 | - | 4.00 | 3.00 | .00 | 2.00 |
| 26 | 2.00 | .00 | .00 | .00 | 100.00 | 4.00 | .00 | .00 | .00 |
| 27 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| % of total (highs) | 65.31 | 100.00 | 25.00 | 0.00 | 82.55[b] | 37.32 | 59.31 | 50.00 | 48.03 |
| % of total (lows) | 34.69 | 0.00 | 75.00 | 0.00 | 68.96[b] | 62.58 | 40.68 | 50.00 | 51.96 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

[b] mean percent

correctly when such questions were asked*. Inspection of this table, however, reveals two pertinent trends. First, high expectancy children exceeded lows on both number of correct answers (65 percent of total) and percent of questions answered correctly (83 percent as compared to 69 percent). Second, children in the low expectancy group were the recipients of more academic praise (63 percent of total) and less academic criticism (41 percent of total).

Individual pupil scores and mean group percentages on measures of teacher response to pupil participation are reported in Table 10. Measures in this category are based on teacher reaction to pu s in public instructional settings. It was previously noted that ic questioning of individual children was a relatively rare occurrence in the classroom. This situation resulted in seriously limiting the extent to which differences in teacher response to pupil participation could be examined**. These data, therefore, are more informative of teacher style than of expectancy group differences.

Discussion and summary. The data for this classroom show a clear pattern with regard to frequency of interaction. Children for whom high performance expectations were held experienced more total contact with teacher than did those who were considered to have less performance potential. The greater contact, however, was largely attributable to

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*It was noted during data collection that this teacher asked a large proportion of chorus questions. Such questions are not coded in the observation system.

**A similar situation existed in other classrooms and will be explained as those results are reported.

Table 10

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 1)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process. Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which Clue of New Question (33) |
| 1 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 100.00 |
| 2 | .00 | 67.00 | 33.00 | 14.00 | - | - | - | - | - |
| 3 | .00 | 67.00 | 17.00 | 14.00 | .00 | 100.00 | .00 | .00 | .00 |
| 4 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 5 | 14.00 | 86.00 | .00 | 14.00 | - | - | - | - | - |
| 6 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 7 | .00 | 80.00 | 20.00 | .00 | .00 | .00 | .00 | 50.00 | .00 |
| 8 | .00 | 75.00 | .00 | 25.00 | - | - | - | - | - |
| 9 | .00 | 100.00 | .00 | .00 | .00 | .00 | .00 | 100.00 | 100.00 |
| 19 | 100.00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 20 | .00 | 100.00 | .00 | 33.00 | - | - | - | - | - |
| 21 | 20.00 | 60.00 | .00 | 40.00 | - | - | - | - | - |
| 22 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 23 | .00 | 100.00 | .00 | .00 | .00 | 50.00 | .00 | .00 | - |
| 24 | .00 | 100.00 | .00 | 50.00 | .00 | .00 | .00 | 100.00 | .00 |
| 25 | - | - | - | - | - | - | - | - | - |
| 26 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 27 | - | - | - | 0.00 | 0.00 | 100.00 | 0.00 | 50.00 | 0.00 |
| Mean Percent (highs) | 1.59 | 86.01 | 7.78 | 7.45 | 0.00 | 20.00 | 0.00 | 50.00 | 66.68 |
| Mean Percent (lows) | 17.14 | 94.29 | 0.00 | 13.70 | 0.00 | 30.00 | 0.00 | 50.00 | 0.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking.

highs seeking out the teacher more frequently. They made more comments or asked more questions during instructional activity which involved the entire class, and they contacted the teacher more often for both instructional assistance and to discuss personal matters.

The pattern of highs being more active in classroom life extended to those interactions initiated or controlled by the teacher. Again, this was due largely to highs volunteering more frequently to answer questions rather than to a systematic exclusion of children in the low expectancy group. The teacher could have compensated for this tendency, however, by specifically directing questions to low expectancy children when they did not volunteer. She did not choose this course of action. Direct questions were evenly distributed between the two groups. Further, she chose not to compensate for the greater private attention demanded by high expectancy children. Instead, she contacted highs and lows equally to offer individual instructional assistance. The one indication of differential teacher behavior favoring lows occurred in relation to academic praise and criticism. The tendency for lows to receive more academic praise and less academic criticism might indicate that the teacher was using this vehicle as an indirect method of encouraging those children for whom she held low performance expectations.

In summary, then, there is little evidence that the teacher behaves differentially toward children on the basis of performance expectations. This is true in terms of both frequency of interaction and the nature of response to pupil participation. Highs are more active in the life of the classroom but the situation results from their own initiative and/or ability.

Classroom 2

The data for Classroom 2 are presented in Tables 11 - 14. Table 11 reports the results of the t test analysis for all three categories of interaction variables. Three significant expectancy group differences were found. All three differences occurred on frequency measures and all involved teacher initiated contact. Further, all three favored those children for whom the teacher held low performance expectations. The teacher initiated more private work contact ($P < .05$), more procedural contact ($P < .10$), and asked more direct questions ($P < .10$) of low expectancy children.

Individual pupil scores and group percentage totals on measures related to frequency of interaction are presented in Table 12. These data are particularly informative in revealing the influence o child on expectancy group differences in student initiated inte Investigation of percent figures alone indicate a moderate tendency for highs to initiate more public work contact (64 percent of total) and for lows to approach the teacher more often for individual instructional attention (61 percent of total). It can be observed, however, that these trends are strongly influenced by the child ranked sixteenth by the teacher. This pupil initiated three times as much interacti n as any other low expectancy child and almost twice as much as any member of the high expectancy group. He accou ed for a major portion of both the public and private work contacts initiated by low expectancy children (70 percent and 46 percent respectively). It is interesting to note that trends relating to student initiated interaction would be considerably different if this child were exclud d from the analysis. Highs would account for 86 percent (rather than 64 percent) of student

Table 11

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 2)

| | Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|---|
| 1 | Direct questions | 0.47 | 0.83 | 3.58 | 3.55 | -2.2532* |
| 2 | Process questions | 1.00 | 1.41 | 1.52 | 2.68 | -0.4556 |
| 3 | Product + choice questions | 6.61 | 3.53 | 4.75 | 4.94 | .8129 |
| 4 | T.I. public work contacts | 11.61 | 5.04 | 10.83 | 7.92 | .2211 |
| 5 | T.I. private work contacts | 3.14 | 1.67 | 10.00 | 7.20 | -2.4531** |
| 6 | Total T.I. work contacts | 14.75 | 5.36 | 20.82 | 13.99 | -1.0711 |
| 7 | T.I. personal contacts | .57 | .79 | .32 | .54 | .7079 |
| 8 | T.I. procedural contacts | 1.76 | 1.96 | 4.22 | 2.47 | -2.0662* |
| 9 | T.I. behavioral contacts | 5.56 | 6.11 | 1.88 | 1.28 | 1.5601 |
| 10 | Student call outs | 4.86 | 4.78 | 1.38 | 2.49 | 1.4452 |
| 11 | S.I. public work contacts | 10.81 | 13.17 | 6.14 | 10.77 | .7265 |
| 12 | S.I. private work contacts | 12.76 | 6.19 | 19.72 | 21.12 | -0.8366 |
| 13 | Total S.I. work contacts | 23.57 | 17.56 | 25.86 | 31.55 | -0.1677 |
| 14 | S.I. personal contacts | 4.00 | 3.74 | 3.76 | 3.41 | .1255 |
| 15 | Total dyadic contacts | 50.59 | 31.50 | 57.17 | 38.65 | -0.3490 |
| 16 | Correct answers | 6.42 | 3.21 | 4.53 | 3.92 | .9916 |
| 17 | Partly correct answers | .43 | .79 | .14 | .38 | .8660 |
| 18 | Wrong answers | .57 | .79 | .14 | .38 | 1.2990 |
| 19 | DK's & R reactions | .00 | .00 | .29 | - | - |
| 20 | % questions answered correctly | 87.44 | 11.85 | 79.62 | 29.44 | .8077 |
| 21 | Academic praise | 2.29 | 3.15 | 2.36 | 1.04 | -0.0570 |
| 22 | Academic criticism | .00 | .00 | .29 | - | - |
| 23 | Behavioral praise | .00 | .00 | .14 | - | - |
| 24 | Behavioral criticism | .00 | .00 | .00 | .00 | - |
| 25 | % correct answers praised | .00 | .00 | .00 | .00 | - |
| 26 | % correct answers affirmed | 92.16 | 9.82 | 79.36 | 21.64 | 1.8962 |
| 27 | % new questions after correct ans. | .00 | .00 | 14.02 | - | - |
| 28 | % answer given no feedback | 7.96 | 8.13 | 9.82 | 14.81 | -0.2818 |
| 29 | % process feedback after failure | .00 | .00 | .00 | .00 | - |
| 30 | % gives answer after failure | 16.67 | - | .00 | .00 | - |
| 31 | % asks another after failure | 25.00 | 50.00 | 16.67 | 28.67 | .2548 |
| 32 | % failure sustained | 25.00 | 50.00 | 59.52 | 36.65 | -1.0014 |
| 33 | % sustain which is clue or NQ | 100.00 | 0.00 | 83.33 | - | - |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

*P < .10
**P < .05

Table 12

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction (Classroom 2)

| Pupils by Expectation Rank | Interaction Variables: Teacher Initiated: Direct Questions (1) | Process Questions (2) | Product + Choice Questions (3) | T.I. Public Work Contacts (4) | T.I. Private Work Contacts (5) | Total T.I. Work Contacts (6) | T.I. Personal Contacts (7) | T.I. Procedure Contacts (8) | T.I. Behavioral Contacts (9) | Student Call Outs (10) | Student Initiated: S.I. Public Work Contacts (11) | S.I. Private Work Contacts (12) | Total S.I. Work Contacts (13) | S.I. Personal Contacts (14) | Total Dyadic Contacts (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 1.00 | 3.00 | 6.00 | 4.00 | 10.00 | 0.00 | 0.00 | 5.00 | 2.00 | 1.00 | 12.00 | 13.00 | 1.00 | 29.00 |
| 2 | .00 | 4.00 | 10.00 | 16.00 | 5.00 | 21.00 | 2.00 | 5.00 | 2.00 | 10.00 | 25.00 | 16.00 | 41.00 | 7.00 | 78.00 |
| 3 | .00 | 1.00 | 5.00 | 13.00 | 4.00 | 17.00 | .00 | .00 | 3.00 | 3.00 | 7.00 | 12.00 | 19.00 | 2.00 | 42.00 |
| 4 | .00 | 1.00 | 13.00 | 20.00 | 2.00 | 22.00 | 1.00 | 3.00 | 19.00 | 13.00 | 34.00 | 20.00 | 54.00 | 1.00 | 110.00 |
| 5 | 1.32 | .00 | 5.30 | 9.27 | .00 | 9.27 | .00 | 1.32 | 3.97 | .00 | 2.65 | 1.32 | 3.97 | 3.97 | 25.16 |
| 6 | 2.00 | .00 | 5.00 | 10.00 | 4.00 | 14.00 | 1.00 | .00 | 1.00 | 2.00 | 2.00 | 18.00 | 20.00 | 2.00 | 38.00 |
| 7 | .00 | .00 | 5.00 | 7.00 | 3.00 | 10.00 | .00 | 3.00 | 5.00 | 4.00 | 4.00 | 10.00 | 14.00 | 1.00 | 33.00 |
| 16 | 8.44 | 7.24 | 3.62 | 16.89 | 7.24 | 24.13 | 1.21 | 6.03 | 3.62 | 2.41 | 30.16 | 63.94 | 94.10 | 7.24 | 137.52 |
| 17 | 3.62 | 2.41 | 3.62 | 16.89 | 8.44 | 25.33 | .00 | 7.24 | [illegible] | .00 | 3.62 | 24.13 | 27.75 | .00 | 60.32 |
| 18 | 1.00 | 1.00 | 3.00 | 11.00 | 15.00 | 26.00 | 1.00 | 6.00 | 2.00 | 2.00 | 1.00 | 12.00 | 13.00 | 2.00 | 50.00 |
| 19 | 4.00 | .00 | 15.00 | 19.00 | 20.00 | 39.00 | .00 | 5.00 | 1.00 | 7.00 | .00 | 7.00 | 7.00 | 2.00 | 54.00 |
| 20 | 8.00 | .00 | 10.00 | 12.00 | 16.00 | 28.00 | .00 | 3.00 | [illegible] | 2.00 | 3.00 | 2.00 | 5.00 | 5.00 | 45.00 |
| 21 | .00 | .00 | .00 | .00 | 2.00 | 2.00 | .00 | 1.00 | [illegible] | .00 | .00 | 7.00 | 7.00 | 1.00 | 12.00 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | 1.29 | 1.29 | 0.00 | 1.29 | 2.59 | 0.00 | 5.17 | 21.97 | 27.14 | 9.05 | 41.36 |
| % of Total (Lows) | 11.70 | 39.66 | 58.21 | 51.75 | 23.92 | 39.05 | 64.41 | 29.42 | 74.68 | 71.72 | 63.79 | 39.29 | 47.69 | 51.55 | 46.95 |
| % of Total (Highs) | 88.30 | 60.34 | 41.79 | 48.25 | 76.08 | 60.95 | 35.59 | 70.58 | 25.32 | 28.29 | 36.22 | 60.71 | 52.32 | 48.45 | 53.05 |

initiated public work contact, and the reported tendency for lows to initiate more private work interaction would disappear.

Individual scores and group percentage totals on measures related to pupil performance and teacher evaluation are reported in Table 13. These data complement results of the t-test analysis in showing that, for the most part, high and low expectancy groups performed equally well in answering teacher questions. Although highs answered more questions correctly (59 percent of total), only minimal group difference existed in the percent of questions answered correctly (87 percent for highs and 80 percent for lows).

Individual pupil scores and mean group percentages on measures of teacher response to pupil participation are presented in Table 14. Inspection of these data reveal a situation similar to that experienced in Classroom 1. Although public questioning was more common, most questions were answered correctly, thereby limiting the number of meaningful measures of teacher response. No major expectancy group trends were indicated.

Discussion and summary. In order to gain a realistic perspective of interaction patterns involving high and low expectancy children in this classroom, the data must be viewed within the context of the overpowering effect of one child on student initiated contact. As previously noted, the child ranked fifteenth by the teacher far exceeded all other pupils in the number of times he contacted the teacher for work related matters. Group percentage figures, therefore, suggested a tendency for low expectancy pupils to initiate more interaction with the teacher than pupils in the high expectancy group. This finding, however, is

Table 13

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 2)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 4.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | 11.00 | 2.00 | 1.00 | .00 | 78.57 | 1.00 | .00 | .00 | .00 |
| 3 | 6.00 | .00 | .00 | .00 | 100.00 | 3.00 | .00 | .00 | .00 |
| 4 | 11.00 | 1.00 | 2.00 | .00 | 78.57 | 9.00 | .00 | .00 | .00 |
| 5 | 3.97 | .00 | .00 | .00 | 74.90 | .00 | .00 | .00 | .00 |
| 6 | 4.00 | .00 | 1.00 | .00 | 80.00 | 2.00 | .00 | .00 | .00 |
| 7 | 5.00 | .00 | .00 | .00 | 100.00 | 1.00 | .00 | .00 | .00 |
| 16 | 9.65 | .00 | .00 | .00 | 88.86 | 1.21 | .00 | .00 | .00 |
| 17 | 6.03 | .00 | .00 | .00 | 100.00 | 2.41 | .00 | .00 | .00 |
| 18 | 4.00 | .00 | .00 | .00 | 100.00 | 2.00 | 2.00 | .00 | .00 |
| 19 | 9.00 | .00 | 1.00 | 1.00 | 69.23 | 3.00 | .00 | .00 | .00 |
| 20 | 3.00 | 1.00 | .00 | 1.00 | 40.00 | 3.00 | .00 | 1.00 | .00 |
| 21 | .00 | .00 | .00 | .00 | - | 1.00 | .00 | .00 | .00 |
| 22 | 0.00 | 0.00 | 0.00 | 0.00 | - | 3.88 | 0.00 | 0.00 | 0.00 |
| % of total (highs) | 58.67 | 75.00 | 80.00 | 0.00 | 87.44[b] | 49.23 | 0.00 | 0.00 | 0.00 |
| % of total (lows) | 41.33 | 25.00 | 20.00 | 100.00 | 79.62[b] | 50.77 | 100.00 | 100.00 | 0.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

[b] mean percent

Table 14

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 2)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which is Clue of New Question (33) |
| 1 | 0.00 | 100.00 | 0.00 | 0.00 | – | – | – | – | – |
| 2 | .00 | 81.82 | .00 | 18.75 | .00 | 66.67 | .00 | .00 | – |
| 3 | .00 | 83.33 | .00 | 7.69 | – | – | – | – | – |
| 4 | .00 | 100.00 | .00 | 15.00 | .00 | .00 | .00 | .00 | – |
| 5 | .00 | 100.00 | .00 | .00 | .00 | .00 | 100.00 | .00 | – |
| 6 | .00 | 100.00 | .00 | .00 | .00 | .00 | .00 | 100.00 | 100.00 |
| 7 | .00 | 80.00 | .00 | 14.25 | – | – | – | – | – |
| 16 | 0.00 | 50.05 | 50.05 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 100.00 |
| 17 | .00 | 80.10 | 20.00 | .00 | – | – | – | – | – |
| 18 | .00 | 100.00 | .00 | .00 | – | – | – | – | – |
| 19 | .00 | 66.67 | .00 | 15.79 | .00 | .00 | 50.00 | 50.00 | 50.00 |
| 20 | .00 | 100.00 | .00 | 33.33 | .00 | .00 | .00 | 28.57 | 100.00 |
| 21 | – | – | – | – | – | – | – | – | – |
| 22 | – | – | – | – | – | – | – | – | – |
| Mean Percent (highs) | 0.00 | 92.24 | 0.00 | 7.96 | 0.00 | 16.67 | 25.00 | 25.00 | 100.00 |
| Mean Percent (lows) | 0.00 | 79.36 | 14.01 | 9.82 | 0.00 | 0.00 | 16.67 | 59.52 | 83.33 |

No. Dash (–) indicates denominator = 0.

[a] in order of expectation ranking

misleading. The extent to which this child demanded teacher attention tends to mask interaction patterns involving the rest of the children in the high and low groups. Although it was not the purpose of the study to investigate pupil characteristics related to patterns of teacher-pupil interaction, it is interesting to note that, in another phase of the research project, this child was described by the teacher as being of average ability, very enthusiastic, and one who "needs extra instructions to understand what he is doing". (Teacher Interview Transcripts, 1976)

Generally then, the data suggest a moderate tendency for high expectancy children to play a more dominate role in classroom life than low [redacted]children. This situation resulted from their own initia[redacted] volunteering to answer questions and in seeking out the teacher for individual attention. Further, it existed in spite of what could be considered a major effort on the part of the teacher to increase the amount of participation of those children for whom she held low performance expectations. It appears that the teacher recognized the tendency for highs to be more active in initiating interaction and attempted, with some success, to equalize the amount of attention received by children in the two groups. During public instruction, or instruction involving the entire class, the groups were provided equal opportunity to answer questions. The lows, however, were called on more often to answer direct questions*. This shows that the teacher equalized public opportunity by directly encouraging the participation

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*Direct questions are those which involve the teacher pre-selecting a pupil to answer or calling on one who does not volunteer.

of low expectancy children. The teacher further attempted to involve low expectancy children by contacting them more frequently for individual instructional assistance.

No expectancy group differences were observed on the limited number of operational variables describing teacher response to pupil participation. The communication of performance expectations are normally associated with these measures of teacher behavior. Patterns of interaction previously described, however, suggest the possibility of an expectation effect phenomenon somewhat different from that usually discussed in the literature. The attention afforded low expectancy children, especially the tendency for the teacher to ask them more direct questions and contact them more frequently for individual assistance, would almost certainly increase their opportunity to learn. In addition, it might lead them to believe that the teacher considered them worthy of her attention and thereby serve to encourage, motivate, and raise levels of self-concept. The fact that no expectancy group differences existed on measures related to praise and encouragement following pupil participation might be taken as further support for the possible operation of positive expectation effects.

In summary, then, the data for this classroom indicate differential teacher behavior favoring low expectancy children. Such differential behavior occurred in quantity rather than quality of interaction. The behavior might have occurred in an attempt to compensate for high expectancy children creating more response opportunities for themselves. No direct evidence of the teacher communicating performance expectations was found. Some basis might exist, however, for suggesting the presence of positive process expectation effects.

Classroom 3

The data for Classroom 3 are presented in Tables 15 - 18. The t test analysis (see Table 15) produced one significant expectancy group difference and this occurred on a measure only indirectly related to teacher-pupil interaction. High expectancy children answered a larger percentage of teacher afforded questions correctly than did children in the low expectancy group ($P < .10$). The vast majority of measures directly related to teacher-pupil interaction produced very low t ratios.

Individual pupil scores and group percentage totals on measures related to frequency of interaction are presented in Table 16. Two trends relating to public instructional activity are revealed in this table. Both require cautious interpretation. High expectancy children initiated more public work contact than low expectancy children (68 percent of total). It can be observed, however, that this trend existed as a result of the influence of two children (high expectancy pupils 2 and 9). Low expectancy children were asked more direct questions by the teacher than were children for whom she held high expectations (74 percent of total). This trend was based on relatively few occurrences. The teacher asked only 16 direct questions during the period of observation.

Discussion and summary. In general, the data for this classroom portray a situation in which teacher behavior appears quite independent of the expectations held for pupil performance. Neither high nor low expectancy children enjoyed an advantage in frequency or quality of interaction with the teacher. Although highs were more successful in their attempts to answer questions, the teacher did not respond to this situation by affording them more opportunity to answer questions or by

Table 15

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 3)

| | Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|---|
| 1 | Direct questions | 0.43 | 0.73 | 1.20 | 1.62 | -1.3807 |
| 2 | Process questions | 1.00 | 1.63 | .62 | .71 | .6665 |
| 3 | Product + choice questions | 1.35 | 1.29 | 1.20 | 1.55 | .2351 |
| 4 | T.I. public work contacts | 2.75 | 2.49 | 2.52 | 1.94 | .2267 |
| 5 | T.I. private work contacts | 5.38 | 3.42 | 6.00 | 2.21 | -0.4839 |
| 6 | Total T.I. work contacts | 8.13 | 4.32 | 8.52 | 3.05 | -0.2376 |
| 7 | T.I. personal contacts | .00 | - | .10 | - | - |
| 8 | T.I. procedural contacts | 3.28 | 2.16 | 3.50 | 1.43 | -0.2726 |
| 9 | T.I. behavioral contacts | 2.60 | 4.53 | 2.30 | 2.91 | .1763 |
| 10 | Student call outs | .50 | 1.08 | .10 | .32 | 1.1239 |
| 11 | S.I. public work contacts | 3.03 | 4.07 | 1.40 | 1.51 | 1.1843 |
| 12 | S.I. private work contacts | 5.15 | 3.56 | 6.32 | 4.57 | -0.6398 |
| 13 | Total S.I. work contacts | 8.18 | 4.74 | 7.7[illegible] | 5.00 | .2079 |
| 14 | S.I. personal contacts | .70 | 1.06 | .9[illegible] | .99 | -0.4353 |
| 15 | Total dyadic contacts | 23.58 | [illegible] | 23.34 | 6.82 | .0656 |
| 16 | Correct answers | 1.90 | [illegible] | .60 | .70 | 1.5501 |
| 17 | Partly correct answers | .00 | .00 | .62 | - | - |
| 18 | Wrong answers | .23 | .48 | .20 | .42 | .1240 |
| 19 | DK & NR reactions | .23 | .48 | .20 | .42 | .1240 |
| 20 | % questions answered correctly | 78.57 | 39.34 | 39.37 | 41.96 | 1.8576* |
| 21 | Academic praise | 1.30 | 1.06 | 1.37 | 1.38 | -0.1329 |
| 22 | Academic criticism | .10 | - | .00 | - | - |
| 23 | Behavioral praise | .60 | .52 | .90 | 1.28 | -0.6843 |
| 24 | Behavioral criticism | .20 | .42 | .20 | .63 | .5000 |
| 25 | % correct answers praised | .00 | .00 | 12.50 | - | - |
| 26 | % correct answers affirmed | 100.00 | .00 | 100.00 | .00 | - |
| 27 | % new questions after correct ans. | .00 | .00 | .00 | .00 | - |
| 28 | % answer given no feedback | .00 | .00 | .00 | .00 | - |
| 29 | % process feedback after failure | .00 | .00 | .00 | .00 | - |
| 30 | % gives answer after failure | .00 | .00 | .00 | .00 | - |
| 31 | % asks another after failure | 75.00 | 35.36 | 50.00 | 33.33 | .9091 |
| 32 | % failure sustained | 25.00 | 35.36 | 19.44 | 30.58 | .2165 |
| 33 | % sustain which is clue or NQ | 100.00 | 0.00 | 75.00 | - | - |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

*P < .10

Table 16

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction (Classroom 3)

| Pupils by Expectation Rank | Interaction Variables: Teacher Initiated: Direct Questions (1) | Process Questions (2) | Product + Choice Questions (3) | T.I. Public Work Contacts (4) | T.I. Private Work Contacts (5) | Total T.I. Work Contacts (6) | T.I. Personal Contacts (7) | T.I. Procedure Contacts (8) | T.I. Behavioral Contacts (9) | Student Call Outs (10) | Student Initiated: S.I. Public Work Contacts (11) | S.I. Private Work Contacts (12) | Total S.I. Work Contacts (13) | S.I. Personal Contacts (14) | Total Dyadic Contacts (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.00 | 0.00 | 1.00 | 1.00 | 10.00 | 11.00 | 0.00 | 1.00 | 15.00 | 0.00 | 0.00 | 3.00 | 3.00 | 3.00 | 34.00 |
| 2 | .00 | 2.00 | 4.00 | 7.00 | 10.00 | 17.00 | .00 | 5.00 | 3.00 | 3.00 | 11.00 | 1.00 | 12.00 | 2.00 | 39.00 |
| 3 | 2.00 | 2.00 | 2.00 | 4.00 | 4.00 | 8.00 | .00 | 3.00 | .00 | .00 | .00 | 8.00 | 8.00 | .00 | 20.00 |
| 4 | .00 | .00 | .00 | 2.00 | 4.00 | 6.00 | .00 | 7.00 | .00 | .00 | 2.00 | 13.00 | 15.00 | 1.00 | 29.00 |
| 5 | .00 | .00 | 1.00 | 1.00 | .00 | 1.00 | .00 | 3.00 | 3.00 | .00 | 1.00 | 5.00 | 6.00 | .00 | 13.00 |
| 6 | .00 | .00 | .00 | 1.00 | 3.00 | 4.00 | .00 | 4.00 | .00 | .00 | 2.00 | 7.00 | 9.00 | 1.00 | 19.00 |
| 7 | 1.25 | .00 | 2.50 | 2.50 | 3.75 | 6.25 | .00 | 3.75 | .00 | .00 | 1.25 | 2.50 | 3.75 | .00 | 13.75 |
| 8 | .00 | .00 | .00 | .00 | 9.00 | 9.00 | .00 | 5.00 | 1.00 | .00 | .00 | 4.00 | 4.00 | .00 | 20.00 |
| 9 | .00 | 5.00 | 2.00 | 7.00 | 3.00 | 10.00 | .00 | 1.00 | 2.00 | 2.00 | 10.00 | 6.00 | 16.00 | .00 | 30.00 |
| 10 | .00 | 1.00 | 1.00 | 2.00 | 7.00 | 9.00 | .00 | .00 | 2.00 | .00 | 3.00 | 2.00 | 5.00 | .00 | 16.00 |
| 22 | .00 | 1.00 | .00 | 2.00 | 10.00 | 12.00 | .00 | 4.00 | .00 | .00 | 4.00 | 4.00 | 8.00 | 1.00 | 26.00 |
| 23 | .00 | .00 | .00 | .00 | 7.00 | 7.00 | 1.00 | 4.00 | 1.00 | .00 | .00 | 1.00 | 1.00 | 1.00 | 15.00 |
| 24 | 2.00 | 1.00 | 1.00 | 4.00 | 6.00 | 10.00 | .00 | 5.00 | 9.00 | .00 | 3.00 | 3.00 | 6.00 | .00 | 30.00 |
| 25 | 2.00 | 2.00 | 2.00 | 4.00 | 6.00 | 10.00 | .00 | 1.00 | 1.00 | .00 | 2.00 | 7.00 | 9.00 | 1.00 | 22.00 |
| 26 | 5.00 | .00 | 5.00 | 5.00 | 4.00 | 9.00 | .00 | 4.00 | 5.00 | .00 | 1.00 | 3.00 | 4.00 | 2.00 | 24.00 |
| 27 | 1.00 | .00 | 2.00 | 5.00 | 9.00 | 14.00 | .00 | 2.00 | 1.00 | 1.00 | 3.00 | 16.00 | 19.00 | 1.00 | 38.00 |
| 28 | .00 | 1.24 | .00 | 1.24 | 4.98 | 6.22 | .00 | 4.98 | .00 | .00 | .00 | 6.22 | 6.22 | .00 | 17.42 |
| 29 | .00 | .00 | 1.00 | 1.00 | 3.00 | 4.00 | .00 | 5.00 | .00 | .00 | .00 | 12.00 | 12.00 | .00 | 21.00 |
| 30 | .00 | .00 | .00 | .00 | 6.00 | 6.00 | .00 | 2.00 | 2.00 | .00 | .00 | 4.00 | 4.00 | 3.00 | 17.00 |
| 31 | 2.00 | 1.00 | 1.00 | 4.00 | 4.00 | 7.00 | 0.00 | 3.00 | 4.00 | 0.00 | 1.00 | 7.00 | 8.00 | 0.00 | 23.00 |
| % of Total (Lows) | 26.15 | 61.57 | 52.94 | 52.38 | 47.26 | 48.80 | 0.00 | 48.35 | 53.06 | 83.33 | 68.36 | 44.65 | 51.50 | 43.75 | 50.04 |
| % of Total (Highs) | 73.85 | 38.42 | 47.06 | 47.62 | 52.74 | 51.19 | 100.00 | 51.65 | 46.94 | 16.66 | 31.64 | 55.35 | 48.50 | 56.25 | 49.96 |

Table 17

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 3)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 1.00 | 0.00 | 0.00 | 0.00 | 100.00 | 2.00 | 0.00 | 1.00 | 1.00 |
| 2 | 6.00 | .00 | .00 | .00 | 100.00 | 3.00 | 1.00 | .00 | .00 |
| 3 | 2.00 | .00 | 1.00 | 1.00 | 50.00 | 2.00 | .00 | 1.00 | .00 |
| 4 | .00 | .00 | .00 | .00 | - | .00 | .00 | .00 | .00 |
| 5 | 1.00 | .00 | .00 | .00 | 100.00 | 1.00 | .00 | .00 | .00 |
| 6 | .00 | .00 | .00 | .00 | - | 2.00 | .00 | 1.00 | .00 |
| 7 | .00 | .00 | 1.25 | 1.25 | .00 | .00 | .00 | .00 | .00 |
| 8 | .00 | .00 | .00 | .00 | - | 2.00 | .00 | 1.00 | .00 |
| 9 | 7.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | 1.00 | 1.00 |
| 10 | 2.00 | .00 | .00 | .00 | 100.00 | 1.00 | .00 | 1.00 | 1.00 |
| 22 | 1.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | 3.00 | .00 |
| 23 | .00 | .00 | .00 | .00 | - | .00 | .00 | 2.00 | .00 |
| 24 | .00 | 1.00 | 1.00 | .00 | .00 | 2.00 | .00 | 1.00 | .00 |
| 25 | 1.00 | 1.00 | 1.00 | .00 | 25.00 | 2.00 | .00 | .00 | .00 |
| 26 | 2.00 | 2.00 | .00 | .00 | 40.00 | 1.00 | .00 | 1.00 | 1.00 |
| 27 | 1.00 | .00 | .00 | 1.00 | 50.00 | 2.00 | .00 | .00 | .00 |
| 28 | .00 | 1.24 | .00 | .00 | .00 | 3.73 | .00 | .00 | .00 |
| 29 | 1.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | 3.00 | .00 |
| 30 | .00 | .00 | .00 | .00 | - | .00 | .00 | .00 | .00 |
| 31 | 0.00 | 1.00 | 0.00 | 1.00 | 0.00 | 3.00 | 0.00 | 0.00 | 2.00 |
| % of total (highs) | 76.00 | 0.00 | 52.94 | 52.94 | 78.57[b] | 44.48 | 100.00 | 37.50 | 50.00 |
| % of total (lows) | 24.00 | 100.00 | 47.06 | 47.06 | 39.37[b] | 55.52 | 0.00 | 62.50 | 50.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

[b] mean percent

Table 18

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 3)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which is Clue of New Question (33) |
| 1 | 0.00 | 100.00 | 0.00 | 0.00 | - | - | - | - | - |
| 2 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 3 | .00 | 100.00 | .00 | .00 | .00 | .00 | 100.00 | .00 | - |
| 4 | - | - | - | - | - | - | - | - | - |
| 5 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 6 | - | - | - | - | - | - | - | - | - |
| 7 | - | - | - | .00 | .00 | .00 | 50.00 | 50.00 | 100.00 |
| 8 | - | - | - | - | - | - | - | - | - |
| 9 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 10 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 22 | [illegible] | 100.00 | .00 | .00 | - | - | - | - | - |
| 23 | [illegible] | - | - | - | - | - | - | - | - |
| 24 | [illegible] | - | - | .00 | .00 | .00 | 50.00 | 50.00 | 100.00 |
| 25 | [illegible] | 100.00 | .00 | .00 | .00 | 33.33 | 66.67 | .00 | - |
| 26 | 50.00 | 100.00 | .00 | .00 | .00 | .00 | 33.33 | 66.67 | 50.00 |
| 27 | .00 | 100.00 | .00 | .00 | .00 | .00 | 100.00 | .00 | - |
| 28 | - | - | - | .00 | .00 | .00 | .00 | .00 | - |
| 29 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 30 | - | - | - | - | - | - | - | - | - |
| 31 | - | - | - | 0.00 | 0.00 | 0.00 | 50.00 | 0.00 | - |
| Mean % (highs) | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 75.00 | 25.00 | 100.00 |
| Mean % (lows) | 12.50 | 100.00 | 0.00 | 0.00 | 0.00 | 5.56 | 50.00 | 19.45 | 75.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

contacting them more frequently for individual attention. Further, high and low groups demonstrated similar activity in seeking out the teacher and initiating interaction with her. There was some tendency for highs to initiate more unsolicited comments or questions in public settings, but this activity was infrequent and initiation was irregularly distributed within groups.

The data describing teacher response to pupil participation was, again, more informative of teacher style than of expectancy group difference. The teacher always informed the child as to the accuracy of his answer, but praise was reserved for private interaction and criticism was a rare occurrence. When questions were answered correctly, they were affirmed without praise. When they were answered incorrectly, the teacher either sustained the child or negated the answer and asked another pupil. This pattern was followed with all children regardless of expectancy group.

In summary, no systematic differences were found in teacher behavior toward high and low ranked children.

Classroom 4

The data for Classroom 4 are presented in Tables 19 - 22. Table 19 reports the findings of the t test analysis for all three categories of interaction variables. One significant expectancy group difference was found and this was on a measure of teacher initiated interaction. Low expectancy children were asked more direct questions than were children in the high expectancy group ($P < .05$).

Individual pupil scores and group percentage totals on measures related to frequency of interaction are presented in Table 20.

Table 19

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 4)

| | Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|---|
| 1 | Direct questions | 0.78 | 1.64 | 2.27 | 1.17 | -2.2294** |
| 2 | Process questions | 4.70 | 4.86 | 3.64 | 2.25 | .5929 |
| 3 | Product + choice questions | 10.73 | 5.51 | 12.32 | 6.38 | -0.5649 |
| 4 | T.I. public work contacts | 16.34 | 8.61 | 17.32 | 6.10 | -0.2789 |
| 5 | T.I. private work contacts | .79 | .45 | 1.34 | 1.12 | -1.3870 |
| 6 | Total T.I. work contacts | 17.13 | 8.51 | 18.67 | 6.48 | -0.4310 |
| 7 | T.I. personal contacts | .00 | .00 | .00 | .00 | - |
| 8 | T.I. procedural contacts | 2.02 | 2.35 | 3.64 | 2.45 | -1.4274 |
| 9 | T.I. behavioral contacts | 3.13 | 5.32 | 3.01 | 4.07 | .0548 |
| 10 | Student call outs | .00 | .00 | .00 | .00 | - |
| 11 | S.I. public work contacts | 3.01 | 2.39 | 2.80 | 2.41 | .1859 |
| 12 | S.I. private work contacts | 2.98 | 2.82 | 4.92 | 2.39 | -1.5812 |
| 13 | Total S.I. work contacts | 5.99 | 3.89 | 7.72 | 2.37 | -1.1430 |
| 14 | S.I. personal contacts | .23 | .46 | .67 | 1.12 | -1.0740 |
| 15 | Total dyadic contacts | 29.29 | 10.95 | 34.61 | 6.88 | -1.2344 |
| 16 | Correct answers | 11.63 | 7.00 | 10.48 | 4.78 | -0.4068 |
| 17 | Partly correct answers | 1.33 | 1.32 | 1.17 | 1.23 | .2640 |
| 18 | Wrong answers | 1.91 | .93 | 2.85 | 2.14 | -1.2053 |
| 19 | DK & NR reactions | .22 | .44 | .89 | 1.05 | -1.7504 |
| 20 | % questions answered correctly | 75.12 | 13.32 | 65.02 | 13.35 | 1.6057 |
| 21 | Academic praise | .44 | .73 | .49 | .58 | -0.1326 |
| 22 | Academic criticism | .11 | .33 | .70 | 1.13 | -1.4891 |
| 23 | Behavioral praise | .00 | .00 | .00 | .00 | - |
| 24 | Behavioral criticism | .67 | 1.41 | .58 | 1.16 | .1456 |
| 25 | % correct answers praised | 2.31 | 4.71 | 1.59 | 4.76 | .3255 |
| 26 | % correct answers affirmed | 94.59 | 7.09 | 96.16 | 5.16 | -0.5381 |
| 27 | % new questions after correct | .46 | .00 | .00 | .00 | - |
| 28 | % answer given no feedback | 15.30 | 6.94 | 12.02 | 7.73 | .9482 |
| 29 | % process feedback after failure | 8.68 | 16.89 | 2.22 | 6.67 | 1.0612 |
| 30 | % gives answer after failure | 2.50 | 7.07 | 2.78 | 5.51 | -0.0909 |
| 31 | % asks another after failure | 47.57 | 32.65 | 57.41 | 24.61 | -0.7068 |
| 32 | % failure sustained | 1.39 | 3.93 | 2.78 | 5.51 | -0.5909 |
| 33 | % sustain which is clue or NQ | 100.00 | 0.00 | 50.00 | - | - |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

**$P < .05$

Table 20

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction (Classroom 4)

| Pupils by Expectation Rank | Interaction Variables: Teacher Initiated: Direct Questions (1) | Process Questions (2) | Product + Choice Questions (3) | T.I. Public Work Contacts (4) | T.I. Private Work Contacts (5) | Total T.I. Work Contacts (6) | T.I. Personal Contacts (7) | T.I. Procedure Contacts (8) | T.I. Behavioral Contacts (9) | Student Call Outs (10) | Student Initiated: S.I. Public Work Contacts (11) | S.I. Private Work Contacts (12) | Total S.I. Work Contacts (13) | S.I. Personal Contacts (14) | Total Dyadic Contacts (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.00 | 3.00 | 16.00 | 20.00 | 1.00 | 21.00 | 0.00 | 1.00 | 0.00 | 0.00 | 3.00 | 2.00 | 5.00 | 1.00 | 28.00 |
| 2 | .00 | 1.00 | 4.00 | 6.00 | 1.00 | 7.00 | .00 | .00 | .00 | .00 | .00 | 1.00 | 1.00 | .00 | 8.00 |
| 3 | 5.00 | 17.00 | 15.00 | 32.00 | .00 | 32.00 | .00 | 1.00 | .00 | .00 | 5.00 | 6.00 | 11.00 | .00 | 46.00 |
| 4 | .00 | 4.00 | 8.00 | 13.00 | 1.00 | 14.00 | .00 | 3.00 | 7.00 | .00 | 4.00 | .00 | 4.00 | .00 | 29.00 |
| 5 | .00 | 4.00 | 15.00 | 19.00 | 1.00 | 20.00 | .00 | 4.00 | 2.00 | .00 | 1.00 | 1.00 | 2.00 | .00 | 28.00 |
| 6 | .00 | 3.30 | 6.59 | 12.09 | 1.10 | 13.19 | .00 | 2.20 | 2.20 | .00 | 1.10 | 8.79 | 9.89 | 1.10 | 28.58 |
| 7 | 1.00 | 3.00 | 8.00 | 11.00 | 1.00 | 12.00 | .00 | 7.00 | 16.00 | .00 | 5.00 | 2.00 | 7.00 | .00 | 42.00 |
| 8 | 1.00 | 6.00 | 19.00 | 26.00 | 1.00 | 27.00 | .00 | .00 | 1.00 | .00 | 1.00 | 2.00 | 3.00 | .00 | 32.00 |
| 9 | .00 | 1.00 | 5.00 | 8.00 | .00 | 8.00 | .00 | .00 | .00 | .00 | 7.00 | 4.00 | 11.00 | .00 | 22.00 |
| 20 | 2.20 | 5.50 | 13.19 | 18.69 | 1.10 | 19.79 | .00 | 2.20 | 1.10 | .00 | 4.40 | 5.50 | 9.90 | .00 | 34.07 |
| 21 | 3.00 | 2.00 | 25.00 | 30.00 | 1.00 | 31.00 | .00 | .00 | .00 | .00 | 1.00 | 2.00 | 3.00 | 2.00 | 37.00 |
| 22 | 2.00 | 6.00 | 9.00 | 17.00 | 1.00 | 18.00 | .00 | 7.00 | 3.00 | .00 | 3.00 | 5.00 | 8.00 | .00 | 37.00 |
| 23 | 3.00 | 2.00 | 19.00 | 21.00 | 2.00 | 23.00 | .00 | 2.00 | 4.00 | .00 | .00 | 9.00 | 9.00 | .00 | 38.00 |
| 24 | 1.27 | 1.27 | 12.69 | 15.23 | .00 | 15.25 | .00 | 2.54 | .00 | .00 | 3.81 | 3.81 | 7.62 | .00 | 25.39 |
| 25 | 4.00 | 7.00 | 13.00 | 20.00 | 4.00 | 24.00 | .00 | 3.00 | 1.00 | .00 | 1.00 | 5.00 | 6.00 | 1.00 | 37.00 |
| 26 | 3.00 | 1.00 | 7.00 | 10.00 | 1.00 | 11.00 | .00 | 7.00 | 13.00 | .00 | 8.00 | 2.00 | 10.00 | 3.00 | 46.00 |
| 27 | 2.00 | 5.00 | 6.00 | 12.00 | 1.00 | 13.00 | .00 | 3.00 | 1.00 | .00 | 2.00 | 4.00 | 6.00 | .00 | 23.00 |
| 28 | 0.00 | 3.00 | 6.00 | 12.00 | 1.00 | 13.00 | 0.00 | 6.00 | 4.00 | 0.00 | 2.00 | 8.00 | 10.00 | 0.00 | 34.00 |
| % of Total (Highs) | 25.48 | 53.89 | 46.56 | 48.54 | 36.98 | 47.85 | 0.00 | 35.73 | 51.00 | 0.00 | 51.81 | 37.68 | 43.67 | 25.93 | 45.84 |
| % of Total (lows) | 74.52 | 46.11 | 53.44 | 51.46 | 63.02 | 52.15 | 0.00 | 64.27 | 49.01 | 0.00 | 48.19 | 62.32 | 56.33 | 74.07 | 54.16 |

Inspection of these data reveal a moderate tendency for lows to experience more interaction with the teacher in other contexts as well. While highs and lows were equally active in initiating public work contact, the lows exceeded the highs in both student initiated private work interaction (62 percent of total) and student initiated personal contact (74 percent of total). This latter trend, however, is based on very few occurrences. Data relating to interaction initiated or controlled by the teacher similarly reveal a trend for lows to be slightly more active. Sixty-three percent of the private work contacts afforded by the teacher involved low expectancy children. Finally, lows exceeded highs in teacher initiated contact for procedural matters (64 percent of total).

Table 21 reports individual pupil scores and group percentage totals on measures related to pupil performance and teacher evaluation of pupil performance. These data reveal a slight tendency for highs to be more successful in their attempts to answer teacher questions. Highs provided correct answers to 75 percent of the questions asked while lows answered 65 percent of their questions correctly. In addition, lows provided more wrong answers (60 percent of total) and either made no response or replied that they did not know the answer more frequently (80 percent of total). In terms of teacher evaluation of pupil performance, academic praise and criticism were relatively rare occurrences. When praise was offered it was evenly distributed. Criticism was more frequently afforded low expectancy children (86 percent of total). It can be observed, however, that these trends were based on a small amount of data.

The data in Table 22 reiterate the findings of the t test

Table 21

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 4)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 16.00 | 1.00 | 2.00 | 0.00 | 84.21 | 1.00 | 0.00 | 0.00 | 0.00 |
| 2 | 5.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | .00 | .00 |
| 3 | 24.00 | 4.00 | 3.00 | 1.00 | 75.00 | 2.00 | .00 | .00 | .00 |
| 4 | 8.00 | .00 | 3.00 | .00 | 66.67 | .00 | 1.00 | .00 | 2.00 |
| 5 | 14.00 | 2.00 | 2.00 | .00 | 73.68 | .00 | .00 | .00 | .00 |
| 6 | 7.69 | .00 | 2.20 | .00 | 77.76 | .00 | .00 | .00 | .00 |
| 7 | 8.00 | 1.00 | 2.00 | .00 | 72.73 | 1.00 | .00 | .00 | 4.00 |
| 8 | 19.00 | 2.00 | 2.00 | 1.00 | 76.00 | .00 | .00 | .00 | .00 |
| 9 | 3.00 | 2.00 | 1.00 | .00 | 50.00 | .00 | .00 | .00 | .00 |
| 20 | 13.19 | 3.30 | 1.10 | .00 | 70.57 | 1.10 | .00 | .00 | 2.20 |
| 21 | 19.00 | .00 | 6.00 | 2.00 | 70.37 | .00 | .00 | .00 | .00 |
| 22 | 7.00 | 1.00 | 6.00 | .00 | 46.67 | 1.00 | .00 | .00 | .00 |
| 23 | 15.00 | .00 | 4.00 | 1.00 | 71.43 | .00 | .00 | .00 | .00 |
| 24 | 10.15 | 1.27 | 2.54 | .00 | 72.71 | 1.27 | 1.27 | .00 | .00 |
| 25 | 12.00 | [illegible] | 3.00 | 3.00 | 60.00 | .00 | .00 | .00 | .00 |
| 26 | 4.00 | [illegible] | .00 | 1.00 | 50.00 | .00 | 3.00 | .00 | 3.00 |
| 27 | 6.00 | [illegible] | 3.00 | 1.00 | 54.55 | .00 | 2.00 | .00 | .00 |
| 28 | 8.00 | [illegible] | 1.00 | 0.00 | 88.89 | 1.00 | 0.00 | 0.00 | 0.00 |
| % of total (highs) | 52.60 | 51.00 | 39.87 | 20.00 | 75.12[b] | 47.79 | 13.76 | 0.00 | 53.57 |
| % of total (lows) | 47.40 | 49.00 | 60.13 | 80.00 | 65.02[b] | 52.21 | 86.25 | 0.00 | 46.43 |

[a] in order of expectation ranking

[b] mean percent

Table 22

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 4)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which is Clue of New Question (33) |
| 1 | 0.00 | 100.00 | 0.00 | 10.00 | 0.00 | 0.00 | 33.33 | 0.00 | - |
| 2 | .00 | 100.00 | .00 | 16.67 | - | - | - | - | - |
| 3 | 8.33 | 83.33 | 4.17 | 9.38 | 44.44 | .00 | 22.22 | 11.11 | 100.00 |
| 4 | .00 | 100.00 | .00 | 15.38 | 25.00 | .00 | 25.00 | .00 | - |
| 5 | .00 | 85.71 | .00 | 26.32 | .00 | 20.00 | .00 | .00 | - |
| 6 | .00 | 100.00 | .00 | 9.10 | .00 | .00 | 100.00 | .00 | - |
| 7 | 12.50 | 87.50 | .00 | 18.18 | .00 | .00 | 66.67 | .00 | - |
| 8 | .00 | 94.74 | .00 | 7.69 | .00 | .00 | 66.67 | .00 | - |
| 9 | .00 | 100.00 | .00 | 25.00 | .00 | .00 | 66.67 | .00 | - |
| 20 | 0.00 | 91.66 | 0.00 | 11.77 | 0.00 | 0.00 | 60.00 | 0.00 | - |
| 21 | .00 | 94.74 | .00 | 10.00 | .00 | .00 | 75.00 | .00 | - |
| 22 | 14.29 | 85.71 | .00 | 23.53 | .00 | 12.50 | 50.00 | 12.50 | 100.00 |
| 23 | .00 | 93.33 | .00 | 9.52 | .00 | .00 | 83.83 | .00 | - |
| 24 | .00 | 100.00 | .00 | 25.02 | .00 | .00 | 33.33 | .00 | - |
| 25 | .00 | 100.00 | .00 | 10.00 | .00 | 12.50 | 25.00 | 12.50 | .00 |
| 26 | .00 | 100.00 | .00 | 10.00 | .00 | .00 | 50.00 | .00 | - |
| 27 | .00 | 100.00 | .00 | 8.33 | 20.00 | .00 | 40.00 | .00 | - |
| 28 | 0.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100.00 | 0.00 | - |
| Mean Percent (highs) | 2.31 | 94.59 | 0.46 | 15.30 | 8.68 | 2.50 | 47.57 | 1.39 | 100.00 |
| Mean Percent (lows) | 1.59 | 96.16 | 0.00 | 12.02 | 2.22 | 2.78 | 57.41 | 2.78 | 50.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

analysis. There were no expectancy group differences on variables related to teacher response to pupil participation.

Discussion and summary. The data for this classroom show that low expectancy children were involved in more interaction with the teacher than were children for whom high expectations were held. The difference was minimal when viewed in terms of total contact, but more marked with respect to individual private attention and the specific designation of individual pupils to answer questions during public instructional activity. The compensatory interpretation (i.e., the teacher creates more interaction opportunity for lows as a result of recognizing that highs demand more attention on their own initiative) would seem inappropriate for this classroom. It gains some support from the finding that opportunity to participate in public instructional activity was equalized by the teacher specifically designating lows more often than highs. It is contradicted, however, in the finding that lows were not only afforded more private attention by the teacher, but that they contacted her more often for individual assistance on their own initiative. A more reasonable interpretation might be that the teacher simply perceived a need for low expectancy children to receive more of her attention. This interpretation receives a modicum of support from findings related to pupil performance.

There was no evidence of differential behavior in teacher response to pupil participation. Again, these data served only to indicate general teacher style and to show that performance expectations were not being communicated through reaction to pupil participation. There was a general reluctance on the part of the teacher to sustain

either correct or incorrect answers. When correct answers were given she typically offered affirmation and went on to other matters. When incorrect answers were given she tended to either request the correct answer from another child or let the question drop. This pattern was followed with both high and low expectancy children.

In summary, the data suggest minimal differential teacher behavior favoring low expectancy children. The differences occurred with respect to frequency rather than quality of interaction. In general, the communication of performance expectations cannot be inferred. When combined with overall findings, however, the difference in number of direct questions asked high and low groups might suggest expectation effects of the type discussed with respect to Teacher 2.

Classroom 5

The data for Classroom 5 are presented in Tables 23 - 26. Table 23 reports the results of the t test analysis for all three categories of interaction variables. Significant expectancy group differences were found on a number of measures relating to frequency of interaction. In the area of student initiated interaction highs exceeded lows in number of public work contacts ($P < .10$) and in total work contacts ($P < .10$). In the area of interaction initiated or controlled by the teacher significant differences favoring highs were found on number of questions asked during public instructional activity ($P < .05$); this was particularly evident with respect to product and choice questions ($P < .01$). Highs also exceeded lows on number of teacher initiated procedural contacts ($P < .05$). The overall influence of these differences resulted in a significant difference favoring highs in total amount of dyadic contact

Table 23

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 5)

| Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|
| 1 Direct questions | 1.78 | - | 0.00 | 0.00 | - |
| 2 Process questions | 4.15 | 2.55 | 2.53 | 2.18 | 1.3688 |
| 3 Product + choice questions | 5.55 | 3.23 | 1.63 | 1.55 | 3.0954*** |
| 4 T.I. public work contacts | 11.58 | 5.49 | 5.19 | 3.04 | 2.8796** |
| 5 T.I. private work contacts | 6.39 | 2.97 | 5.69 | 2.37 | .5167 |
| 6 Total T.I. work contacts | 17.97 | 6.81 | 10.88 | 2.41 | 2.7754** |
| 7 T.I. personal contacts | .38 | .52 | .43 | .88 | -0.1426 |
| 8 T.I. procedural contacts | 5.21 | 2.02 | 3.44 | 1.03 | 2.2068** |
| 9 T.I. behavioral contacts | 1.88 | 2.17 | .43 | .89 | 1.7437 |
| 10 Student call outs | .13 | .36 | .66 | .74 | -1.7168 |
| 11 S.I. public work contacts | 6.96 | 4.63 | 3.07 | 2.51 | 2.0886* |
| 12 S.I. private work contacts | 6.40 | 4.80 | 3.29 | 2.96 | 1.5602 |
| 13 Total S.I. work contacts | 13.36 | 7.95 | 6.35 | 5.14 | 2.0932* |
| 14 S.I. personal contacts | 2.68 | 2.44 | 1.28 | 1.98 | 1.2630 |
| 15 Total dyadic contacts | 41.83 | 13.46 | 22.81 | 7.84 | 3.4533*** |
| 16 Correct answers | 8.33 | 4.02 | 3.76 | 2.33 | 2.7818 |
| 17 Partly correct answers | .38 | .52 | .25 | .46 | .5092 |
| 18 Wrong answers | 1.00 | .76 | .15 | .42 | 2.7734** |
| 19 DK & NR reactions | .00 | .00 | .00 | .00 | - |
| 20 % questions answered correctly | 88.26 | 8.21 | 91.96 | 12.60 | -0.6954 |
| 21 Academic praise | 3.13 | 2.59 | 1.33 | 1.09 | 1.8077 |
| 22 Academic criticism | .00 | .00 | .00 | .00 | - |
| 23 Behavioral praise | .00 | .00 | .00 | .00 | - |
| 24 Behavioral criticism | .00 | .00 | .00 | .00 | - |
| 25 % correct answers praised | 3.60 | 5.06 | 3.13 | 8.84 | .1319 |
| 26 % correct answers affirmed | 74.81 | 24.51 | 65.63 | 38.68 | .5674 |
| 27 % new questions after correct ans. | .00 | .00 | .00 | .00 | - |
| 28 % answer given no feedback | 21.18 | 23.18 | 29.42 | 27.65 | -0.6459 |
| 29 % process feedback after failure | .00 | .00 | .00 | .00 | - |
| 30 % gives answer after failure | 16.67 | - | .00 | .00 | - |
| 31 % asks another after failure | 58.33 | 37.64 | 33.33 | 57.74 | .7977 |
| 32 % failure sustained | 13.89 | - | .00 | .00 | - |
| 33 % sustain which is clue or NQ | 100.00 | - | - | .00 | - |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

*P < .10

**P < .05

***P < .01

($P < .01$).

In addition to expectancy group differences on frequency variables, significant differences were found on measures of pupil performance. High expectancy children provided both more correct answers ($P < .05$) and more wrong answers ($P < .05$) to teacher questions. It is of interest that no group difference was found on the variable, percent of total questions answered correctly. No expectancy group difference was found on any variable relating to teacher reaction to pupil participation or teacher evaluation of pupil performance. It is of interest that statistical analysis could not be performed on a number of measures in these categories as a result of the teacher directing no attention to low expectancy children.

Tables 24, 25, and 26 provide further insight into the nature of teacher-pupil interaction in the classroom. They elaborate the findings presented in Table 26 and indicate trends that did not reach statistical significance. The data relating to academic praise (see Table 25) indicate a tendency for the teacher to bestow more praise on high expectancy children. Highs received 70 percent of the total praise afforded by the teacher. Two further trends regarding teacher response to pupil participation are indicated in the data reported in Table 26. Both, however, are based on relatively small group differences. It is their consistency that makes them notable. There was a tendency for the teacher to fail to provide feedback to lows more often than to highs (29 percent compared to 21 percent), and a tendency to sustain highs more frequently after an incorrect answer (14 percent compared to zero percent). It should be noted that this latter trend was influenced by the small number of questions answered incorrectly by low expectancy children.

Table 24

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction (Classroom 5)

| Pupils by Expectation Rank | Interaction Variables: Teacher Initiated: Direct Questions (1) | Process Questions (2) | Product + Choice Questions (3) | T.I. Public Work Contacts (4) | T.I. Private Work Contacts (5) | Total T.I. Work Contacts (6) | T.I. Personal Contacts (7) | T.I. Procedure Contacts (8) | T.I. Behavioral Contacts (9) | Student Call Outs (10) | Student Initiated: S.I. Public Work Contacts (11) | S.I. Private Work Contacts (12) | Total S.I. Work Contacts (13) | S.I. Personal Contacts (14) | Total Dyadic Contacts (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.00 | 7.00 | 10.00 | 20.00 | 7.00 | 27.00 | 0.00 | 4.00 | 0.00 | 0.00 | 3.00 | 5.00 | 8.00 | 0.00 | 39.00 |
| 2 | .00 | 5.00 | 2.00 | 10.00 | 6.00 | 16.00 | .00 | 6.00 | 2.00 | .00 | 2.00 | 3.00 | 5.00 | 1.00 | 30.00 |
| 3 | 1.22 | 1.22 | 2.43 | 3.65 | 6.08 | 9.73 | .00 | 3.65 | .00 | .00 | 3.65 | 1.22 | 4.87 | 2.43 | 20.68 |
| 4 | .00 | 1.00 | 2.00 | 5.00 | 7.00 | 12.00 | .00 | 7.00 | 1.00 | .00 | 7.00 | 16.00 | 23.00 | 8.00 | 51.00 |
| 5 | 1.00 | 3.00 | 8.00 | 12.00 | 4.00 | 16.00 | 1.00 | 3.00 | 2.00 | 1.00 | 7.00 | 3.00 | 10.00 | 1.00 | 36.00 |
| 6 | 4.00 | 5.00 | 5.00 | 11.00 | 4.00 | 15.00 | .00 | 4.00 | 6.00 | .00 | 16.00 | 10.00 | 26.00 | 3.00 | 54.00 |
| 7 | 3.00 | 8.00 | 6.00 | 16.00 | 13.00 | 29.00 | 1.00 | 9.00 | 4.00 | .00 | 11.00 | 5.00 | 16.00 | 3.00 | 62.00 |
| 8 | .00 | 3.00 | 9.00 | 15.00 | 4.00 | 19.00 | 1.00 | 5.00 | .00 | .00 | 6.00 | 8.00 | 14.00 | 3.00 | 42.00 |
| 18 | .00 | .00 | 3.61 | 3.61 | 2.41 | 6.02 | 2.41 | 3.61 | .00 | .00 | 2.41 | 1.20 | 3.61 | .00 | 15.65 |
| 19 | .00 | 1.22 | 2.45 | 4.90 | 6.12 | 11.02 | .00 | 4.90 | 2.45 | .00 | 6.12 | 6.12 | 12.24 | 1.22 | 31.83 |
| 20 | .00 | 5.00 | .00 | 8.00 | 4.00 | 12.00 | .00 | 3.00 | 1.00 | .00 | 7.00 | 8.00 | 15.00 | 6.00 | 37.00 |
| 21 | .00 | 5.00 | 4.00 | 10.00 | 3.00 | 13.00 | .00 | 7.00 | .00 | 1.00 | 1.00 | 4.00 | 5.00 | 1.00 | 24.00 |
| 22 | .00 | 1.00 | .00 | 1.00 | 9.00 | 10.00 | .00 | 3.00 | .00 | 1.00 | 3.00 | .00 | 3.00 | 1.00 | 17.00 |
| 23 | .00 | .00 | 1.00 | 2.00 | 8.00 | 10.00 | .00 | 3.00 | .00 | .00 | 4.00 | 5.00 | 9.00 | .00 | 22.00 |
| 24 | .00 | 4.00 | 1.00 | 7.00 | 7.00 | 14.00 | 1.00 | 3.00 | .00 | 2.00 | 1.00 | .00 | 1.00 | .00 | 19.00 |
| 25 | 0.00 | 4.00 | 1.00 | 5.00 | 6.00 | 11.00 | 0.00 | 2.00 | 0.00 | 1.00 | 0.00 | 2.00 | 2.00 | 1.00 | 16.00 |
| % of Total (Highs) | 100.00 | 62.12 | 77.28 | 69.06 | 52.87 | 62.28 | 46.80 | 58.53 | 81.30 | 16.67 | 69.78 | 66.06 | 67.76 | 67.71 | 64.72 |
| % of Total (Lows) | 0.00 | 37.84 | 22.72 | 30.94 | 47.13 | 37.72 | 53.20 | 41.47 | 18.70 | 83.33 | 30.22 | 33.94 | 32.24 | 32.29 | 35.29 |

Table 25

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 5)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 14.00 | 1.00 | 2.00 | 0.00 | 82.35 | 2.00 | 0.00 | 0.00 | 0.00 |
| 2 | 6.00 | .00 | 1.00 | .00 | 85.71 | 3.00 | .00 | .00 | .00 |
| 3 | 3.65 | .00 | .00 | .00 | 100.00 | .00 | .00 | .00 | .00 |
| 4 | 3.00 | .00 | .00 | .00 | 100.00 | 3.00 | .00 | .00 | .00 |
| 5 | 9.00 | 1.00 | 1.00 | .00 | 8.82 | 3.00 | .00 | .00 | .00 |
| 6 | 8.00 | 1.00 | 1.00 | .00 | 80.00 | 3.00 | .00 | .00 | .00 |
| 7 | 13.00 | .00 | 1.00 | .00 | 72.86 | 9.00 | .00 | .00 | .00 |
| 8 | 10.00 | .00 | 2.00 | .00 | 83.33 | 2.00 | .00 | .00 | .00 |
| 18 | 2.41 | .00 | 1.20 | .00 | 66.76 | 1.20 | .00 | .00 | .00 |
| 19 | 3.67 | .00 | .00 | .00 | 100.00 | 2.45 | .00 | .00 | .00 |
| 20 | 5.00 | .00 | .00 | .00 | 100.00 | 2.00 | .00 | .00 | .00 |
| 21 | 8.00 | 1.00 | .00 | .00 | 88.89 | 3.00 | .00 | .00 | .00 |
| 22 | 1.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | .00 | .00 |
| 23 | 1.00 | .00 | .00 | .00 | 100.00 | .00 | .00 | .00 | .00 |
| 24 | 5.00 | .00 | .00 | .00 | 100.00 | 1.00 | .00 | .00 | .00 |
| 25 | 4.00 | 1.00 | 0.00 | 0.00 | 80.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| % of total (highs) | 68.90 | 60.00 | 86.96 | 0.00 | 88.26[b] | 70.13 | 0.00 | 0.00 | 0.00 |
| % of total (lows) | 31.10 | 40.00 | 13.04 | 0.00 | 91.[illegible][b] | [illegible].87 | 0.00 | 0.00 | 0.00 |

[a] in order of expectation ranking

[b] mean percent

Table 26

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 5)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | Teacher Evaluation | | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which is Clue of New Question (33) |
| 1 | 0.00 | 42.86 | 0.00 | 45.00 | 0.00 | 0.00 | 0.00 | 33.33 | 100.00 |
| 2 | .00 | 100.00 | .00 | .00 | .00 | .00 | 100.00 | .00 | - |
| 3 | .00 | 32.42 | .00 | 66.58 | - | - | - | - | - |
| 4 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 5 | 11.11 | 77.78 | .00 | 16.67 | .00 | 50.00 | 50.00 | .00 | - |
| 6 | .00 | 87.50 | .00 | 9.09 | .00 | .00 | 50.00 | 50.00 | 100.00 |
| 7 | 7.69 | 76.92 | .00 | 18.75 | .00 | .00 | 100.00 | .00 | - |
| 8 | 10.00 | 80.00 | .00 | 13.33 | .00 | 50.00 | 50.00 | .00 | - |
| 18 | .00 | .00 | .00 | 66.76 | .00 | .00 | 100.00 | .00 | - |
| 19 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 20 | .00 | 20.00 | .00 | 50.00 | - | - | - | - | - |
| 21 | 25.00 | 75.00 | .00 | 30.00 | .00 | .00 | .00 | .00 | - |
| 22 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 23 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 24 | .00 | 80.00 | .00 | 28.57 | - | - | - | - | - |
| 25 | 0.00 | 50.00 | 0.00 | 60.00 | 0.00 | 0.00 | 0.00 | 0.00 | - |
| Mean Percent (highs) | 3.60 | 74.81 | 0.00 | 21.18 | 0.00 | 16.67 | 58.33 | 13.88 | 100.00 |
| Mean percent (lows) | 3.13 | 65.63 | 0.00 | 29.42 | 0.00 | 0.00 | 33.33 | 0.00 | - |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

Discussion and summary. The data for this classroom reveal that high expectancy children were more active in practically all aspects of classroom interaction. They made more unsolicited comments and asked more questions during large group instruction, and they demanded more teacher attention during those times reserved for individual assistance. In view of the tendency for highs to create more response opportunities for themselves, it might be expected that the teacher would attempt to balance opportunity when the initiation of interaction was under her control. This, however, was not the case. She called on highs more frequently to answer questions during large group instruction sessions and she volunteered more attention to highs during individual instructional activity. Further, she made no attempt to compensate for the fact that highs volunteered more answers during question and answer sessions. The specific designation of a child to answer a question occurred only 14 times during the observation period and each time the child called upon was a member of the high expectancy group. This occurred even though lows answered as large a percentage of their question correctly. The evidence is strong that the teacher's first priority was the success of those children for whom she held high expectations.

Although frequency data clearly indicate differential teacher behavior favoring high expectancy children, no strong evidence was found that the teacher was communicating performance expectations through her response to pupil participation. Those measures which statistically control frequency of interaction showed, at most, nominal trends favoring high expectancy children. Of the six classrooms in the study, however, she showed the greatest inclination in this direction through her tendency toward more praise and more sustaining

response for high expectancy children.

In summary, then, the teacher demonstrated differential behavior based on expectations for pupil performance. If her performance expectations were communicated to children, however, it was probable that it was through the frequency with which she afforded them attention rather than the manner in which she responded to their participation in classroom activity.

Classroom 6

The data for Classroom 6 are presented in Tables 27 - 30. Table 27 reports the findings of the t test analysis for all three categories of interaction variables. Three significant expectancy group differences were found. High expectancy children initiated more public work interaction than did low expectancy children ($P < .10$) and this contributed to a significant group difference favoring highs on total student initiated contact ($P < .10$). The third significant difference occurred on a measure of teacher response to pupil participation. Highs exceeded lows on percent of sustaining feedback after failure which was of a rephrase or a new question type ($P < .10$)*.

Individual pupil scores and group percentage totals on measures related to frequency of interaction are presented in Table 28. These data elaborate the findings reported above and indicate further trends with regard to the frequency of both student initiated and teacher initiated interaction. In the area of student initiated interaction,

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*Sustaining feedback could also take the form of simply repeating the original question or the child's response.

Table 27

Means, Standard Deviations, and T Ratios for High and Low Expectancy Groups on Interaction Measures (Classroom 6)

| | Interaction Measures | Expectancy Group: Highs $\bar{X}$ | Highs SD | Lows $\bar{X}$ | Lows SD | T Ratio |
|---|---|---|---|---|---|---|
| 1 | Direct questions | 6.96 | 6.36 | 7.32 | 5.60 | -0.1206 |
| 2 | Process questions | 7.60 | 7.19 | 4.88 | 4.57 | .9012 |
| 3 | Product + choice questions | 5.53 | 6.46 | 6.19 | 4.26 | -0.2405 |
| 4 | T.I. public work contacts | 17.26 | 13.62 | 14.91 | 6.48 | .4426 |
| 5 | T.I. private work contacts | 1.52 | 1.15 | 2.54 | 2.36 | -1.0903 |
| 6 | Total T.I. work contacts | 18.79 | 13.77 | 17.44 | 7.14 | .2462 |
| 7 | T.I. personal contacts | .38 | .74 | .86 | 1.18 | -0.9844 |
| 8 | T.I. procedural contacts | 4.39 | 3.88 | 3.63 | 2.61 | .4610 |
| 9 | T.I. behavioral contacts | 1.55 | 1.70 | 1.42 | 1.71 | .1599 |
| 10 | Student call outs | .84 | 1.01 | .49 | .70 | .8055 |
| 11 | S.I. public work contacts | 6.33 | 7.67 | 1.33 | 1.41 | 1.8137* |
| 12 | S.I. private work contacts | 1.00 | .95 | .56 | .86 | .9440 |
| 13 | Total S.I. work contacts | 7.33 | 7.83 | 1.89 | 1.40 | 1.9326* |
| 14 | S.I. personal contacts | .41 | .78 | 1.37 | 1.63 | -1.5164 |
| 15 | Total dyadic contacts | 32.84 | 21.46 | 26.61 | 7.94 | .7700 |
| 16 | Correct answers | 7.30 | 6.47 | 4.76 | 2.91 | 1.0124 |
| 17 | Partly correct answers | 3.05 | 3.73 | 1.99 | 1.70 | .7320 |
| 18 | Wrong answers | 2.06 | 3.04 | 2.33 | 2.47 | -0.1997 |
| 19 | DK & NR reactions | .00 | .00 | .00 | .00 | - |
| 20 | % questions answered correctly | 51.99 | 25.02 | 43.47 | 30.14 | .5898 |
| 21 | Academic praise | 1.62 | 1.62 | .96 | 1.32 | .8901 |
| 22 | Academic criticism | .00 | .00 | .00 | .00 | - |
| 23 | Behavioral praise | .00 | .00 | .00 | .00 | - |
| 24 | Behavioral criticism | .00 | .00 | .00 | .00 | - |
| 25 | % correct answers praised | 10.05 | 8.58 | 8.32 | 14.41 | .2573 |
| 26 | % correct answers affirmed | 74.17 | 29.31 | 75.60 | 35.88 | -0.0780 |
| 27 | % new questions after correct ans. | .00 | .00 | .00 | .00 | - |
| 28 | % answer given no feedback | 12.47 | 19.53 | 11.70 | 15.27 | .0880 |
| 29 | % process feedback after failure | 6.19 | 8.18 | 1.19 | 3.15 | 1.5097 |
| 30 | % gives answer after failure | 7.47 | - | .00 | .00 | - |
| 31 | % asks another after failure | 27.76 | 34.93 | 39.70 | 28.84 | -0.6976 |
| 32 | % failure sustained | 44.03 | 30.20 | 46.70 | 27.57 | -0.1726 |
| 33 | % sustain which is clue or NQ | 81.07 | 24.42 | 40.67 | 42.81 | 2.0080* |

Note. Dash (-) in T ratio column indicates T ratio could not be calculated due to no variance. Dash (-) in SD column indicates SD was not calculated.

*P < .10

Table 28

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Frequency and Type of Interaction (Classroom 6)

| Pupils by Expectation | Interaction Variables: Teacher Initiated | | | | | | | | | | Student Initiated | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Direct Questions | Process Questions | Product + Choice Questions | T.I. Public Work Contacts | T.I. Private Work Contacts | Total T.I. Work Contacts | T.I. Personal Contacts | T.I. Procedure Contacts | T.I. Behavioral Contacts | Student Call Outs | S.I. Public Work Contacts | S.I. Private Work Contacts | Total S.I. Work Contacts | S.I. Personal Contacts | Total Dyadic Contacts |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
| 1 | 14.00 | 22.00 | 12.00 | 40.00 | 1.00 | 41.00 | 2.00 | 2.00 | 1.00 | 2.00 | 19.00 | 1.00 | 20.00 | 2.00 | 68.00 |
| 2 | .00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 3.00 | .00 | .00 | 1.00 | .00 | 1.00 | .00 | 5.00 |
| 3 | 6.00 | 4.00 | 8.00 | 12.00 | 2.00 | 14.00 | 1.00 | 7.00 | 2.00 | .00 | 5.00 | .00 | 5.00 | .00 | 29.00 |
| 4 | 7.00 | 5.00 | 8.00 | 18.00 | 3.00 | 21.00 | .00 | 12.00 | 2.00 | 1.00 | 17.00 | 2.00 | 19.00 | .00 | 54.00 |
| 5 | 4.94 | 12.34 | .00 | 16.04 | 2.47 | 18.51 | .00 | 3.70 | 4.94 | 1.23 | 7.40 | .00 | 7.40 | .00 | 34.55 |
| 6 | 2.47 | 3.70 | .00 | 7.40 | 2.47 | 9.87 | .00 | .00 | 2.47 | .00 | .00 | 1.23 | 1.23 | .00 | 13.57 |
| 7 | 2.46 | 2.47 | .00 | 8.64 | .00 | 8.64 | .00 | 6.17 | .00 | .00 | .00 | 1.23 | 1.23 | .00 | 16.04 |
| 8 | 18.77 | 11.27 | 16.27 | 35.05 | 1.25 | 36.30 | .00 | 1.25 | .00 | 2.50 | 1.25 | 2.50 | 3.75 | 1.25 | 42.56 |
| 19 | 11.27 | 5.01 | 11.27 | 16.27 | 1.25 | 17.52 | 1.25 | 8.26 | .00 | .00 | 1.25 | .00 | 1.25 | 3.75 | 32.55 |
| 20 | 8.94 | 3.70 | 7.40 | 17.27 | 1.23 | 18.50 | .00 | 3.70 | 1.23 | 1.23 | 3.70 | .00 | 3.70 | 1.23 | 28.38 |
| 21 | .00 | .00 | 3.40 | 6.79 | 3.40 | 10.19 | 3.40 | 3.40 | 5.09 | 1.70 | 1.70 | .00 | 1.70 | .00 | 23.77 |
| 22 | 10.00 | 1.00 | 10.00 | 11.00 | 4.00 | 15.00 | 1.00 | 4.00 | 2.00 | .00 | 1.00 | .00 | 1.00 | .00 | 23.00 |
| 23 | 1.23 | .00 | 1.23 | 6.17 | .00 | 6.17 | .00 | 1.23 | .00 | .00 | .00 | 2.47 | 2.46 | 00 | 9.87 |
| 24 | 11.10 | 12.34 | 1.23 | 19.74 | 7.40 | 27.14 | 1.23 | 4.94 | .00 | .00 | .00 | .00 | .00 | .00 | 33.31 |
| 25 | 16.00 | 9.00 | 11.00 | 25.00 | 1.00 | 26.00 | .00 | 3.00 | 1.00 | .00 | .00 | 1.00 | 1.00 | 3.00 | 34.00 |
| 26 | 4.00 | 8.00 | 4.00 | 17.00 | 2.00 | 19.00 | 0.00 | 0.00 | 2.00 | 1.00 | 3.00 | 1.00 | 4.00 | 3.00 | 28.00 |
| % of Total (Highs) | 47.08 | 60.88 | 47.20 | 53.67 | 37.54 | 51.86 | 30.36 | 55.18 | 52.30 | 63.13 | 81.97 | 64.04 | 79.50 | 22.84 | 55.24 |
| % of Total (Lows) | 52.92 | 39.11 | 52.80 | 46.33 | 62.45 | 48.14 | 69.63 | 44.82 | 47.70 | 36.87 | 17.38 | 35.96 | 20.49 | 77.16 | 44.76 |

the data reveal a nominal trend for highs to initiate more private (64 percent of total) as well as more public work contacts. In the area of teacher initiated interaction, there was little difference in the total number of questions asked high and low expectancy children. There was a tendency, however, for highs to be asked more process questions (61 percent of total). Process questions are generally considered to be more complex than those designated as product and choice. Table 28 also shows a tendency for low expectancy children to experience more personal related contact with the teacher. Lows both initiated more personal interaction (77 percent of total) and were contacted by the teacher more frequently to discuss personal matters (70 percent of total). It can be observed, however, that both trends are based on relatively little data.

Individual scores and group percentage totals on measures related to pupil performance are presented in Table 29. These data show a tendency for high expectancy children to provide more correct answers to teacher questions than low expectancy children. This indication of superior performance is not as strong, however, when opportunity is standardized (i.e., percentage of total questions answered correctly).

Table 30 reports individual and mean group percentages on measures of teacher response to pupil participation. Except for the significant group difference reported in Table 27, these data suggest only moderate trends with no definite pattern suggesting systematic favoring of either high or low expectancy children.

Discussion and summary. The data presented in this section suggest a moderate tendency for high expectancy children to play a more dominant role in the life of the classroom. Generally, this situation

Table 29

Pupil Scores and Expectancy Group Percentage Differences on Measures Related to Pupil Performance and Teacher Evaluation (Classroom 6)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | Correct Answers (16) | Partly Correct Answers (17) | Wrong Answers (18) | DK + NR Reactions (19) | % Questions Answered Correctly (20) | Academic Praise (21) | Academic Criticism (22) | Behavioral Praise (23) | Behavioral Criticism (24) |
| 1 | 18.00 | 12.00 | 2.00 | 0.00 | 52.94 | 5.00 | 0.00 | 0.00 | 0.00 |
| 2 | .00 | .00 | .00 | .00 | - | .00 | .00 | .00 | .00 |
| 3 | 9.00 | 3.00 | .00 | .00 | 75.00 | 2.00 | .00 | .00 | .00 |
| 4 | 9.00 | 2.00 | 2.00 | .00 | 69.23 | 1.00 | .00 | .00 | .00 |
| 5 | 6.17 | 2.47 | 3.70 | .00 | 50.00 | 1.23 | .00 | .00 | .00 |
| 6 | 2.47 | 1.23 | .00 | .00 | 66.76 | 1.23 | .00 | .00 | .00 |
| 7 | .00 | 1.23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 8 | 13.77 | 2.50 | 8.76 | .00 | 50.01 | 2.50 | .00 | .00 | .00 |
| 19 | 7.51 | 3.76 | 2.50 | .00 | 46.13 | .00 | .00 | .00 | .00 |
| 20 | 2.47 | 3.70 | 4.94 | .00 | 22.25 | .00 | .00 | .00 | .00 |
| 21 | 3.40 | .00 | .00 | .00 | 100.00 | .00 | .00 | .00 | .00 |
| 22 | 5.00 | .00 | 2.00 | .00 | 45.46 | 1.00 | .00 | .00 | .00 |
| 23 | .00 | .00 | 1.23 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | 3.70 | 2.47 | 1.23 | .00 | 27.26 | 3.70 | .00 | .00 | .00 |
| 25 | 8.00 | 3.00 | 7.00 | .00 | 40.00 | 2.00 | .00 | .00 | .00 |
| 26 | 8.00 | 3.00 | 1.00 | 0.00 | 66.67 | 1.00 | 0.00 | 0.00 | 0.00 |
| % of total (highs) | 60.54 | 55.37 | 45.26 | 0.00 | 51.99[b] | 62.73 | 0.00 | 0.00 | 0.00 |
| % of total (lows) | 39.47 | 44.63 | 54.73 | 0.00 | 43.47[b] | 37.27 | 0.00 | 0.00 | 0.00 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

[b] mean percent

Table 30

Pupil Scores and Mean Expectancy Group Percentages on Measures of Teacher Reaction to Pupil Participation (Classroom 6)

| | Interaction Variables | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Pupil Performance | | | | | Teacher Evaluation | | | |
| Pupils[a] | % Correct Answer Praised (25) | % Correct Answer Affirmed (26) | % New Questions After Correct Answer (27) | % Answers Given No Feedback (28) | % Process Feedback After Failure (29) | % Gives Answer After Failure (30) | % Asks Another After Failure (31) | % Failure Sustained (32) | % Sustain which is Clue of New Question (33) |
| 1 | 11.11 | 61.11 | 0.00 | 17.50 | 17.65 | 0.00 | 35.29 | 29.41 | 80.00 |
| 2 | - | - | - | - | - | - | - | - | - |
| 3 | .00 | 22.22 | .00 | 58.33 | .00 | .00 | 33.33 | 33.33 | 100.00 |
| 4 | 11.11 | 100.00 | .00 | 5.56 | .00 | 25.00 | .00 | 50.00 | 100.00 |
| 5 | 19.94 | 79.90 | .00 | 7.67 | 16.62 | .00 | 16.62 | 50.00 | 66.49 |
| 6 | .00 | 100.00 | .00 | .00 | .00 | .00 | .00 | 100.00 | 100.00 |
| 7 | - | - | - | .00 | .00 | .00 | 100.00 | .00 | - |
| 8 | 18.16 | 81.77 | .00 | 10.70 | 9.08 | 27.31 | 9.08 | 45.46 | 39.94 |
| 19 | .00 | 66.71 | .00 | 15.37 | .00 | .00 | 28.54 | 57.19 | 24.95 |
| 20 | .00 | 100.00 | .00 | 7.12 | .00 | .00 | 28.59 | 57.18 | .00 |
| 21 | .00 | 100.00 | .00 | .00 | - | - | - | - | - |
| 22 | .00 | .00 | .00 | 45.45 | .00 | .00 | 50.00 | 50.00 | .00 |
| 23 | - | - | - | .00 | .00 | .00 | 100.00 | .00 | - |
| 24 | 33.24 | 100.00 | .00 | .00 | .00 | .00 | 12.46 | 87.54 | 85.76 |
| 25 | 25.00 | 87.50 | .00 | 8.00 | 8.33 | .00 | 33.33 | 50.00 | 33.33 |
| 26 | 0.00 | 75.00 | 0.00 | 17.65 | 0.00 | 0.00 | 25.00 | 25.00 | 100.00 |
| Mean Percent (highs) | 10.05 | 74.17 | 0.00 | 12.47 | 6.19 | 7.47 | 27.76 | 44.03 | 81.07 |
| Mean Percent (lows) | 8.32 | 75.60 | 0.00 | 11.69 | 1.19 | 0.00 | 39.70 | 46.70 | 40.67 |

Note. Dash (-) indicates denominator = 0.

[a] in order of expectation ranking

did not result from systematic favoring of highs by the teacher. Rather, this group of children contacted the teacher more often on their own initiative. They were especially more active in making comments and asking questions during large group instruction. In addition, however, they contacted her more often for such purposes as having their work checked or requesting individual instructional assistance.

The teacher made little attempt to compensate for the fact that highs received more attention as a result of their own ability and/or initiative. Although she afforded low expectancy children more private attention, large group instruction occupied a much larger portion of the total classroom activity and this was characterized by highs holding a slight advantage in number of questions answered. Again, the data suggest that this was due to their volunteering more often. The teacher did not, however, choose to equalize opportunity during such activity by asking lows more direct questions. Although such questions were a common occurrence, they were distributed evenly between groups. Personal interaction occurred infrequently in this classroom. When it was observed, however, it more often involved low than high expectancy children. This might indicate that the teacher was using personal interaction as a vehicle for encouraging lows to become more involved in the work related life of the classroom; that she hoped to make them feel involved, at ease, and thus prepared to participate more actively in public instruction on their own initiative. Overall findings appear to add some credence to this possibility.

In responding to pupil participation the teacher showed some evidence of differential behavior. The data suggest that when children answered correctly, she responded in affirmation to both high and

low groups. When they failed to answer correctly, however, there was a tendency for the teacher to behave differently toward the groups. She explained how the answer could be determined to highs more frequently than to lows (process feedback); she gave the correct answer to highs more frequently than to lows; and she asked another pupil more frequently when lows failed to answer correctly than when a similar reply was obtained from highs. It should be noted, however, that none of these trends constituted statistically significant group differences and all are based on relatively little data. One measure of differential response was significant. Although highs and lows had approximately the same percentage of sustaining feedback after failure to answer correctly, the nature of the feedback differed. When sustaining feedback was given, highs were more likely than lows to receive it in the form of a rephrase or clue or an entirely new question. Lows were more likely than highs to simply have either the original question or their own answer repeated. There are at least two possible explanations for this behavior. It might reflect a feeling on the part of the teacher that it was not worthwhile to go to any great effort in an attempt to help low expectancy children experience success in answering the questions. A second, and perhaps more likely, explanation is that the teacher felt questions asked highs were of sufficient complexity to require additional information to produce a correct answer, while those asked lows were of a type that could be corrected simply by providing more time for pupils to consider an alternative answer.

In summary, then, the data for this classroom do not indicate the existence of differential teacher behavior based on expectations for pupil performance. There was some evidence suggesting qualitative

differential behavior favoring highs, but it was not sufficient to support a conclusion that expectation effects were operating.

Discussion and Summary for Six Teachers

The findings of this phase of the study will be compared with previous expectancy research in Chapter 5. In this section only infrequent reference will be made to that body of literature. The purpose of the section is to consolidate the findings reported above and describe procedures followed in facilitating the second stage of investigation.

It would seem prudent, at this point, to remind the reader that the findings reported above, and therefore those to be discussed in this section, are based on trends in the data. Many of these trends did not reach statistical significance. Further, the number of significant expectancy group differences were such that they could be contested on grounds that they were chance occurrences. The findings, therefore, must be viewed with appropriate caution. In addition, investigation of tables reporting individual pupil scores reveal two important, and related, phenomena. First, some children experienced interaction with the teacher that was more characteristic of the expectancy group of which they were not members. Second, within-group interaction patterns were often very discrepant. These phenomena clearly indicate that much more than performance expectations enter into determining patterns of teacher-pupil classroom interaction.

One further observation regarding the data is necessary. As previously noted, two dimensions of teacher-pupil interaction are investigated through the measures used in the study (i.e., frequency and

quality). In general, measures related to frequency of interaction are subject to the influence of pupil ability and initiative. Although findings might indicate that a child experiences more interaction with the teacher, this greater interaction cannot be unambiguously interpreted as an expectation effect in the sense that it connotes systematic favoring of the individual. The possibility exists that the child created the advantage for himself. Two of the frequency measures, however, are only midly susceptible to this possibility. These are number of direct questions and teacher initiated private work contacts. The former describes those public questions specifically directed to an individual pupil when he does not volunteer on his own initiative. The latter describes those contacts that the teacher makes with a child on her initiative for the purpose of providing individual work-related assistance. In this study conclusions regarding the existence of differential teacher behavior were strongly influenced by data relating to these two measures. Measures relating to the second dimension of teacher-pupil interaction are based on direct teacher response to pupil participation. They provide a more concrete basis for inferring the existence of expectation effects. These measures are statistically controlled to compensate for differences in the frequency of pupil participation. Thus, they facilitate direct comparison of the teacher's response to individuals or groups of individuals in equivalent situations. Since measures in this category are based on teacher reaction to pupils when answering questions in public settings, the scope for investigating this dimension of teacher behavior is severely limited if the teacher asks few public qustions, if questions are irregularly distributed within groups, if pupils tend to be consistently correct or consistently

incorrect in their answers, or if the teacher's instructional style is such that praise or sustaining feedback is infrequent. Such limitations were experienced in this study. Praise and criticism during public instruction were infrequent in all classrooms, few incorrect pupil responses were made in four classrooms (Classrooms 1, 2, 3, 5), and sustaining feedback was rare in all but one classroom (Classroom 6). Therefore, conclusive evidence regarding the existence or lack of differential teacher behavior of the type frequently associated with the communication of performance expectations was not obtained in the study. Although differential behavior was found, it related, in most cases, to the frequency with which teachers afforded attention to children. If performance expectations were being communicated through qualitative differences in behavior, it was largely undetectible in the data collected.

The findings of this phase of the study are summarized in Figure 2. Although the summary presents an incomplete description of the behavior of the six teachers, it serves to illustrate two important points. First, differential teacher behavior based on performance expectations existed in classrooms under investigation and it generally took the form of the teacher providing either low or high expectancy groups greater opportunity to participate in classroom life. Second, individual teachers differed considerably in the manner and extent to which they demonstrated differential behavior based on expectations for pupil performance. This latter finding has been reported in other research examining relationship between performance expectations and the nature of teacher-pupil interaction (Evertson, Brophy, and Good, 1972; 1973).

Figure 2

Summary of Teacher-Pupil Work Related Interaction Patterns
in Six Classrooms by Grade and Classroom

| Dimension | Source of Interaction | Measure | Grade 1 Class 1 | Grade 1 Class 2 | Grade 3 Class 3 | Grade 3 Class 4 | Grade 6 Class 5 | Grade 6 Class 6 |
|---|---|---|---|---|---|---|---|---|
| Frequency of Interaction | Pupil | Public | A* | A | A | C | A* | A* |
| | | Private | A | C | C | B | A | A |
| | Teacher | Public | A | B* | C | B* | A* | A |
| | | Private | C | B* | C | B | A | B |
| | Teacher + Pupil | Public + Private | A* | C | C | C | A* | C |
| Quality of Interaction | Teacher | Praise | B | C | C | C | A | C |
| | | Feedback after Correct | C | C | C | C | A | C |
| | | Feedback after Incorrect | C | C | C | C | C | A |

Note. A indicates advantage in the direction of high expectancy children; B indicates advantage in the direction of low expectancy children; C indicates no advantage to either group or insufficient data to made inferences.

*indicates strongest advantage

Brophy and Good (1974) devote considerable attention to a discussion of this matter. The results of numerous investigations caused them to conclude that the tendency to behave differentially toward children on the basis of performance expectations was an individual difference variable and not characteristic of all teachers. They further note that when teachers do exhibit such differential behavior it can take different forms. On the basis of research in the area, they hypothesized three general types of teachers with regard to this phenomena. They emphasize that the classification is relatively loose and that all teachers will not be clearly one type or another in all their interactions with children. It is, however, a convenient categorization and it appears to have been generated from a sound theoretical and empirical basis. The categories are labeled proactive, reactive, and overreactive. Proactive teachers are described as those who used their expectaions, among other things, as a basis for coping positively with individual differences in children. They not only recognize such differences but they ensure that the differences do not inappropriately determine patterns of classroom interaction. Classrooms of proactive teachers tend to be characterized by highs initiating more interaction with the teacher and the teacher directing more attention to lows when the initiation is under her control. This results from an attempt by the teacher to compensate for the tendency of high expectancy children to demand more attention. Reactive teachers are those who simply react to pupil behaviors that are presented in the classroom. They do not systematically favor highs in either quantity or quality of interaction, but neither do they compensate for the fact that highs demand more attention as a result of their own initiative and ability.

Highs, therefore, play a more active role in classroom life. Classrooms of reactive teachers are characterized by substantial expectancy group differences favoring highs on measures related to student initiated interaction but few differences on measures related to teacher initiation. Overreactive teachers not only allow individual pupil differences to dictate patterns of classroom interaction, but actually exacerbate such differences by treating the children as more different than they really are. Classrooms of overreactive teachers are characterized by expectancy group differences favoring highs on measures related to teacher initiated interaction, as well as those related to student initiated interaction. Further, it is the overreactive teacher who is most likely to, consciously or unconsciously, communicate performance expectations through her response to pupil participation. In summary Brophy and Good (1974) state:

> Proactive teachers appear to be undeterred by their expectations for low achieving students, so that they spend more time interacting with lows than highs. Reactive teachers simply allow existing differences between high and low students to unfold so that highs, due to their own initiative and ability, come to dominate public classroom life. A third class of teachers over react to student differences (in supplying quantatively and qualitatively superior treatment to highs), thus exacerbating differences between students. (p. 303)

The data reported in this chapter, and summarized in Figure 2, suggest that four of the six teachers in this study can be classified according to these three categories.

Classroom 2 was characterized by high expectancy children initiating more interaction with the teacher and the teacher, in turn, attempting to compensate for this situation by asking lows more direct questions and by contacting lows more frequently for individual instructional assistance. These interaction patterns closely resemble

those described as characteristic of a classroom under the charge of a proactive teacher. Classrooms 1 and 6 were similar in that the teachers made no systematic attempt to equalize participatory opportunity. In Classroom 1 high expectancy children initiated more interaction of both a public and private nature. Although the teacher did not respond by affording them more attention when initiation was under her control, neither did she attempt to encourage the participation of lows by calling on them more frequently in either public or private contexts. In Classroom 6 high expectancy children were more active in making comments and asking questions during public instructional activity, in answering questions posed by the teacher as volunteers, and in approaching the teacher for individual instructional assistance. Again, the teacher did not respond by initiating more interaction with this group, but she made only modest attempts to compensate by affording lows more opportunity when interaction was under her control. Both of these teachers appeared to simply react to behaviors presented by pupils. As such, they parallel the hypothetical reactive teacher described by Brophy and Good. Classroom 5 was characterized by high expectancy children being more active in practically all aspects of classroom life. Not only did this group initiate interaction, but the teacher responded by affording them more opportunity, on her own initiative, during both public and private instructional activity. The teacher, therefore, reflects the characteristics of the overreactive teacher.

The situation in Classrooms 3 and 4 was such that classification of teachers, according to categories described above, could not be made. In Classroom 4 low expectancy children were involved in more interaction with the teacher than were high expectancy children. This resulted from

the teacher asking them more direct questions, contacting them more frequently for individual attention, and from these children approaching the teacher more often for individual assistance. This latter finding indicates that the teacher was not merely compensating for domination by children in the high expectancy group. This was the case, however, in public interaction; total public teacher initiated work interaction was evenly distributed while lows were asked more direct questions. It appears that the teacher was exhibiting "proactive" tendencies in that she had concluded lows needed more of her assistance, but the overall data are such that she cannot be considered proactive as described by Brophy and Good. The data for Classroom 3 revealed no systematic expectancy group differences in teacher-pupil interaction patterns. Again, there is some evidence of proactive tendencies but the overall nature of the data suggests that considerably more observation time would be needed to obtain sufficient evidence on which to base conclusions regarding teacher type. A summary description of the six teachers by category type is presented in Figure 3.

Figure 3

Description of Six Teachers According to Categories Hypothesized by Brophy and Good

| Teacher | Category Type |
|---|---|
| 1 | Reactive |
| 2 | Proactive |
| 3 | No Classification[a] |
| 4 | No Classification[a] |
| 5 | Overreactive |
| 6 | Reactive |

[a]Reasons for no classification are presented in text.

## TEACHER CHARACTERISTICS AND DIFFERENTIAL TEACHER BEHAVIOR

The second phase of the study involved initial examination of relationships between differential teacher behavior and selected teacher characteristics. The procedures followed in the analysis of data were described in Chapter 3. The analysis utilized the classification of teachers presented above and teacher scores on three psychological tests purporting to measure dimensions of personality. Following a restatement of research questions, the findings related to each of these tests are reported and discussed in turn. In each section attention is focused on those personal attributes which tend to discriminate on the basis of teacher type (i.e., proactive, reactive, and overreactive). The reader is cautioned that, because of the small number of teachers in the study, trends indicate, at best, prima facie evidence of association between teacher characteristics and teacher type.

### Restatement of Research Questions

What relationships exist between process expectation effects and selected teacher characteristics?

More specifically:

a. What relationships exist between each of the personality traits measured by the Sixteen Personality Factor Questionnaire (16 PF) and the nature of teacher susceptibility to process expectation effects?

b. What relationships exist between teacher belief orientation, as measured by the This I Believe (TIB) Test and the nature of teacher susceptibility to process expectation effects?

c. What relationships exist between teacher attitudes toward children, as measured by the Minnesota Teacher Attitude Inventory (MTAI), and the nature of teacher susceptibility to process expectation effects?

Findings Related to the Sixteen Personality Factor Questionnaire (16 PF)

The 16 PF is purported to measure "sixteen functionally independent and psychologically meaningful dimensions [of personality]" (Cattell, 1972, p. 5). Capsule descriptions of the sixteen dimensions are presented in the Test Manual and are reproduced in Appendix E. In reporting and discussing findings, reference is made to these descriptions and to the more detailed explanation provided in the Handbook for the 16 PF (Cattell, 1970).

Teacher scores on the sixteen primary dimensions of the 16 PF are reported in Table 31. Scores are presented as sten scores. Stens are standard scores based on the general adult population norms and distributed over ten equal-interval standard score points from 1 to 10 with a population mean fixed at 5.5. Cattell (1972) suggests that

> One would consider a sten of 5 or 6 average, 4 - 7 slightly deviant (respectively in a low and high direction), 2, 3, 8 and 9 strongly deviant, and 1 or 10 extreme. (p. 15)

Inspection of Table 31 reveals that two factors (Factors A and L) produced scores showing marked differences between the proactive teacher and the overreactive teacher. On Factor A (reserved vs. outgoing) the proactive teacher obtained a high score (sten 7) indicating a tendency to be adaptable and attentive to people. The overreactive teacher obtained a low score (sten 2) indicating a tendency to be cool, aloof, rigid in personal standards, and uncompro-

Table 31

Sten Scores of Teachers on the Sixteen Personality Factor Questionnaire

| Personality Factor | | | Teacher by Type and Classroom | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Low Score Direction | High Score Direction | Proactive | Reactive | | Overreactive | No Classification | |
| | | | 2 | 1 | 6 | 5 | 3 | 4 |
| A | Reserved | Outgoing | 7 | 10 | 3 | 2 | 9 | 8 |
| B | Less intelligent | More intelligent | 7 | 5 | 10 | 7 | 7 | 5 |
| C | Less stable | More stable | 6 | 5 | 6 | 5 | 6 | 8 |
| E | Humble | Assertive | 1 | 8 | 9 | 3 | 6 | 7 |
| F | Sober | Happy-go-lucky | 2 | 4 | 4 | 4 | 9 | 9 |
| G | Expedient | Conscientious | 7 | 5 | 2 | 7 | 2 | 5 |
| H | Shy | Adventuresome | 5 | 4 | 7 | 2 | 9 | 6 |
| I | Tough minded | Tender minded | 9 | 9 | 7 | 10 | 7 | 9 |
| L | Trusting | Suspicious | 1 | 5 | 5 | 7 | 5 | 3 |
| M | Practical | Imaginative | 4 | 6 | 10 | 5 | 8 | 7 |
| N | Forthright | Shrewd | 10 | 6 | 3 | 8 | 2 | 3 |
| O | Placid | Apprehensive | 6 | 6 | 4 | 7 | 5 | 3 |
| $Q_1$ | Conservative | Experimenting | 3 | 6 | 8 | 4 | 10 | 7 |
| $Q_2$ | Group dependent | Self sufficient | 4 | 3 | 8 | 10 | 1 | 3 |
| $Q_3$ | Undisciplined self-conflict | Controlled | 7 | 5 | 3 | 6 | 4 | 7 |
| $Q_4$ | Relaxed | Tense | 4 | 6 | 8 | 7 | 7 | 3 |

mising in viewpoint. There was no pattern in the scores obtained on this factor by the two reactive teachers. On Factor L (trusting vs. suspicious) the proactive teacher had a low score (sten 1) which is indicative of persons who tend to be free of jealous tendencies, adaptable, cheerful, uncompetitive, and concerned about other people. The overreactive teacher had a high score (sten 7) which is indicative of one who is mistrusting, doubtful, involved in his own ego, and unconcerned about other people. The two reactive teachers had average scores (sten 5) on this factor.

In addition to the above differences, four factors (Factors E, G, N, and $Q_1$) produced scores showing similarities between the proactive teacher and the overreactive teacher. Further, scores differentiated these two teachers from those classified as reactive. On Factor E (humble vs. assertive), both obtained low scores (sten 1 and sten 3 respectively) while the two reactive teachers obtained high scores (stens 8 and 9). Persons with a low score on this factor tend to be mild, accommodating, and conforming. They have a tendency to be dependent, anxious for obsessional correctness, and often give way to others in times of confrontation. Individuals who score high on the factor tend to be assertive, self-assured, and independent-minded. They are inclined to be authoritarian when in a position of managing others. On Factor G (expedient vs. conscientious) both had higher scores (sten 7) than either of the reactive teachers (stens 2 and 5). A high score on this factor is indicative of a person who is dominated by a sense of duty, and is perservering, responsible, and planful. A low score indicates a tendency to be unsteady in purpose and often casual and

lacking in undertakings. On Factor N (forthright vs. shrewd) both the proactive teacher and the overreactive teacher obtained high scores (stens 10 and 8 respectively) while the reactive teachers had average and low scores (stens 5 and 2). The individual who scores high on this factor is described as being worldly, penetrating, sharp at clinical diagnosis, and flexible in viewpoint. A low score indicates one who is unsophisticated, somewhat simplistic, and easily pleased with what comes along. The final trend indicating similarity between the proactive teacher and the overreactive teacher occurred on Factor $Q_1$ (conservative vs. experimenting). These teachers obtained lower scores (sten 3 and 4 respectively) than the two reactive teachers (stens 6 and 8). A low score indicates a tendency to be confident in what one has been taught to believe even when inconsistencies are evident. A high score indicates an analytical individual who tends to have doubts on fundamental issues and is inquiring regarding ideas, either old or new.

Discussion and summary. The findings reported above show that, although none of the factors of the 16 PF discriminated perfectly on the basis of teacher type, a few trends were notable. First, the data indicated that the proactive teacher and the overreactive teacher were similar to one another and different from the reactive teachers in a number of ways. Briefly, they were: 1) more responsible and dominated to a greater extent by a sense of duty; 2) more astute in the area of clinical diagnosis and more flexible in viewpoint; 3) less assertive, less self-assured, and less independent-minded; and 4) less analytical and inquiring with respect to issues and ideas. That these teacher types were similar to one another and different from the reactive teachers on

certain personality measures is not surprising. They are also similar in regard to one important aspect of classroom behavior; they both assume initiative in controlling classroom interaction patterns. In the classroom, they differ only in terms of the group of children which is afforded the greater attention. The direction of differences on the first two factors might also be expected. The finding that they possess sharper diagnostic skills might suggest that they are better able to recognize what is happening in the classroom and thus able to behave in ways other than simply reacting passively to behaviors presented by children. Being dominated by a greater sense of duty might suggest a reason for their tendency to gain and maintain control of interaction patterns. As noted, however, this explanation ignores one important fact. The proactive teacher affords greater attention to low expectancy children while the overreactive teacher initiates more interaction with children for whom high expectations are held. It is possible that this difference is largely a function of teacher role perception. It is of interest that, in another phase of the research project, these teachers responded to a question concerning role perception in the following manner:

> Proactive teacher-
> I think I should try to guide them... each child has his own needs... this is how I am going to teach. If I expect everyone to write the same answer, that's not the way it should be. Each child, I guide him differently, the way he wants to go.
>
> Overreactive teacher-
> My most important task is to get the very most out of every child... I think that's my task, to get the very most out of them and have them consider me as a friend they can come and talk to but still knowing I won't allow them to get away with poor work and still knowing that they have to do their very best for me. (Teacher Interview Transcripts, 1976)

This line of speculation would lead to the conclusion that the over-reactive teacher was intentionally affording high expectancy children greater attention. While this is possible, there is no basis in the interaction data for inferring such intent.

While the direction of the first two findings was expected, that of the latter two is somewhat incongruous with classroom behavior patterns. One might expect proactive and overreactive teachers to score higher than reactive teachers on a personality dimension related to assertiveness and independent-mindedness. Such was not the case, however, in this study. Reactive teachers obtained much higher scores on this factor. The finding might suggest that the reactive teachers in the study felt low expectancy children should be more aggressive in creating interaction opportunity on their own initiative (i.e., be more like themselves). Thus, they would decline to compensate directly for the greater interaction initiated by highs. This possibility receives a modicum of support in the earlier finding that both reactive teachers revealed behavior that could be interpreted as indirect encouragement of low expectancy children. (i.e., Teacher 1 praised lows more in private interaction while Teacher 6 contacted lows more frequently for personal discussion.) An alternate, and perhaps more plausible, explanation is that the finding was a function of the small sample of teachers. The finding that reactive teachers tended to be more experimenting and less conservative is also somewhat difficult to reconcile with classroom behavior. Again, one might expect teachers who took initiative in classroom interaction to score higher on this dimension.

In addition to the similarities discussed above, the data revealed that the proactive teacher and the overractive teacher differed from one another in scores obtained on two personality dimensions. Both findings were compatible, in theory, with teacher type. On these dimensions the proactive teacher was revealed as trusting, adaptable, and concerned about other people while the overreactive teacher was described as mistrusting, aloof, often involved in her own ego and relatively unconcerned about other people. It would seem that observed classroom behavior was consistent with scores obtained on these personality dimensions. A possible explanation of such compatibility centers around the concept of personal reward. Most individuals want evidence that their professional efforts have a positive effect. It would be natural for teachers to want confirmation that their efforts are resulting in pupil growth or attainment. Those teachers who are less trusting, more involved in their own egos, and less concerned about other people might look to children with greater potential to provide such confirmation in the form of correct answers to questions about academic material. Those teachers who are more concerned about other people, more adaptable, and feel less need to feed their own egos, might be more likely to sacrifice such immediate confirmation for the more elusive reward of seeing children with less potential achieve success.

In summary, scores obtained on six of the dimensions of the 16 PF revealed differences among teachers in the study when classified as proactive, reactive, and overreactive. The proactive teacher and the overreactive teacher obtained very similar scores on four dimensions

and widely divergent scores on two dimensions. Although the pattern was less clear for reactive teachers, they often differed from the former types on scores obtained.

It should be noted that it is the combination of factors that provide the best overall description of personality. A more accurate view of relationships between personality and teacher type could be obtained by examining total profiles. Such an examination, however, would require a study involving a larger sample of teachers.

Findings Related to the This I Believe (TIB) Test

The TIB is a projective test which classifies individuals according to belief orientations ranging from concrete to abstract. Classification is made on the basis of responses to a number of socially and personally based referents (Harvey, 1966). Each subject is classified into one of four belief systems (System 1, 2, 3, and 4). Where traces of more than one system are found, the most prevalent system is recorded first. The secondary system is indicated by the appropriate number preceded by a dash. For example, 1 - 4 indicates that the subject is categorized as having a predominately System 1 belief orientation with traces of System 4. The test also provides scores on seven auxiliary dimensions related to belief systems. Auxiliary dimension scores are reported in terms of position on a five point scale, 1 indicating a low score and 5 indicating a high score. As explained in Chapter 3, tests were scored by trained personnel under the direction of test designer, O. J. Harvey. Descriptions of the four belief systems and seven auxiliary dimensions are presented in Appendix D.

Teacher scores on belief systems and auxiliary dimensions are presented in Table 32. The data in this table reveal that the test did not discriminate among teacher type on either overall belief system classification or auxiliary dimension scores. The one finding of interest was that Teacher 3 differed from other subjects in that she was classified as predominantly System 4. All other teachers were classified as predominantly System 1. Thus in terms of the four belief systems, she can be described as follows:

1. She is relatively free of extreme evaluativeness or extreme acceptance-rejection behavior.

Table 32

Teachers' Scores on the This I Believe Test

| | Teacher by Type and Classroom | | | | | |
|---|---|---|---|---|---|---|
| | Proactive | | Reactive | Overreactive | No Classification | |
| Measure | 2 | 1 | 6 | 5 | 3 | 4 |
| Belief System | 1-4 | 1-4 | 1-2 | 1-2 | 4-1 | 1-4 |
| Auxiliary Dimension | | | | | | |
| Openness | 3 | 3 | 2 | 2 | 4 | 3 |
| Candor | 3 | 3 | 3 | 3 | 5 | 4 |
| Evaluativeness | 3 | 3 | 3 | 4 | 1 | 3 |
| Externality | 2 | 3 | 1 | 2 | 1 | 1 |
| Cynicism | 1 | 1 | 2 | 3 | 1 | 1 |
| Optimism | 3 | 3 | 2 | 2 | 3 | 3 |
| Complexity | 3 | 3 | 3 | 3 | 4 | 3.5 |

2. She is the least dependent on authorities as guides for what she should believe and do.

3. She has the largest repertoire of methods for solving problems.

4. She has a more complex, more differentiated cognitive structure.

Discussion and summary. It was previously noted that, of the six teachers in the study, Teacher 3 showed the least tendency toward interacting differently with children on the basis of performance expectations. It is of interest that this teacher was also the only one to reveal an abstract belief orientation. It would be irresponsible, however, to infer too much from these data. It was explained in an earlier section that the interaction data from Classroom 3 was such that sound conclusions regarding differential behavior could not be formulated. The classroom was characterized by relatively little public interaction. The teacher's instructional style tended to be one of presenting material and directions to the entire group and then working with children on an individual basis. The data that were collected, however, suggested a situation in which classroom interaction patterns were unrelated to teacher performance expectations.

It is not entirely unexpected that the TIB test did not discriminate teacher type in this study. Harvey (1970) reports that

> only a small percentage of teachers (approximately 7 percent) appear to be functioning at a level of System 4 while a large majority represent clear System 1 functioning or an admixture of System 1 with System 3. (p. 80)

And Jeffares (1973) used the instrument with 21 teachers and found 67

percent were classified as System 1 while only 14 percent were classified as System 4. This would indicat that the findings in the present study might be a function of the small sample.

Findings Related to the Minnesota Teacher Attitude Inventory (MTAI)

The MTAI was designed to measure attitudes which predict how well a teacher will get along in interpersonal relationships with pupils.

The results for all six teachers are presented in Table 33. Scores are reported as percentile ranks. Inspection of this table reveals that the MTAI did not discriminate among teacher type. All six teachers were near, or above, the upper quantile rank.

Table 33

Percentile Ranks of Teachers on the Minnesota Teacher Attitude Inventory

| | Teacher by Type and Classroom | | | | | |
|---|---|---|---|---|---|---|
| | Proactive | Reactive | | Overreactive | No Classification | |
| | 2 | 1 | 6 | 5 | 3 | 4 |
| Percentile rank | 88 | 73 | 86 | 73 | 76 | 74 |

Again, it is not entirely unexpected that the MTAI did not discriminate teacher type. The nature of sample selection (i.e., volunteer) could well be related to the consistently high scores obtained.

Summary: Teacher Type and Teacher Characteristics

The purpose of this phase of the study was to provide initial investigation into relationships between selected teacher characteristics and susceptibility to process expectation effects (i.e., teacher type). Teachers were classified according to the nature of their interaction with high and low expectancy children. Scores on three psychological tests were used to describe teacher characteristics.

The data revealed the following trends:

1. Six dimensions of the Sixteen Personality Factor Questionnaire revealed differences among teachers classified as proactive, reactive, and overreactive. In general, these differences were consistent with what might have been expected on the basis of findings relating to classroom interaction patterns.

2. Scores on the This I Believe test and scores on the Minnesota Teacher Attitude Inventory failed to differentiate subjects according to teacher type. One trend, however, occurred with regard to scores on the This I Believe test. The teacher who showed the least tendency to treat children differentially on the basis of performance expectations revealed a belief system markedly different from the other five. For reasons discussed above, however, little confidence can be placed in this finding.

3. The latter two tests (TIB, MTAI), for different reasons, were particularly susceptible to the small, volunteer sample used in the study.

In concluding this section, it would seem prudent to caution the reader with regard to the interpretation of findings reported and discussed above. Findings represent trends in the data. No statistical

analysis was performed to determine levels of statistical significance. Also, findings were based on a small sample of teachers. Two of the three teacher categories included only one subject. For these reasons, the findings indicate only that teachers in this study differed in the ways described. No generalization to a larger population of teachers is possible. Findings are suggestive of associations that might be worthy of pursuit in a large study using more sophisticated procedures.

## SUMMARY

In this chapter, the findings relating to the two phases of the study were reported and discussed. The first phase of the study investigated relationships between differential teacher expectations and the nature of teacher-pupil interaction. The data were analyzed by classroom. Briefly, the analysis revealed that differential teacher behavior based on performance expectations was evident in the classrooms under investigation but that the extent and nature of such behavior varied considerable from teacher to teacher. Generally, differential behavior took the form of either high or low expectancy groups being afforded greater opportunity to participate in the work-related life of the classroom. Few qualitative differences were found in the study. This was due, in part, to data limitations. The nature of differential behavior was such that four of the six teachers could be categorized according to classifications hypothesized by Brophy and Good (1974). This classification provided a convenient vehicle for conceptualizing overall findings and facilitating the second phase of the study.

The second phase of the study, investigated relationships between

teacher differential behavior and scores on three psychological tests purporting to measure dimensions of personality. Teacher scores on the Sixteen Personality Factor Questionnaire, the This I Believe Test, and the Minnesota Teacher Attitude Inventory were inspected to determine if any of the dimensions measured differentiated according to teacher type (i.e., proactive, reactive, overreactive). The analysis revealed that scores on six factors of the 16 PF discriminated on this basis. The proactive teacher and the overreactive teacher were similar to one another and different from the reactive teachers on four personality traits measured by the 16 PF. They differed from one another on two other traits. Scores on the This I Believe Test and the Minnesota Teacher Attitude Inventory failed to discriminate on the basis of teacher type.

Chapter 5 will summarize the study and present conclusions and recommendations based on the findings.

# Chapter 5

## SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter is presented in three sections. The first section provides a summary of the investigation; the second section presents conclusions which have been drawn from the findings; the final section makes recommendations for future research.

## SUMMARY

Rosenthal's controversial Oak Hill experiment stimulated considerable research in the area of teacher expectations. Since 1968, a variety of paradigms have been used to investigate different aspects of the self-fulfilling prophecy hypothesis. Although the findings of this body of research are mixed, the evidence appears to weigh in favor of the existence of expectation effects. The most convincing evidence derives from research involving naturally formed teacher expectations and using process measures as dependent variables. A considerable number of studies have reported that teachers interact more frequently and more positively with children for whom they hold high performance expectations. Recent research by Brophy, Good, and colleagues, however, indicates that such behavior is far from universal. Accumulated evidence from a series of investigations by these researchers demonstrated that teachers differ considerably in extent and nature of susceptibility to expectation effects. On the basis of evidence collected in this research, they hypothesized three general teacher types with regard to such suscept-

ibility. These types are: (1) proactive teachers who tend to initiate more interaction with low expectancy children, possibly in an attempt to compensate for the greater attention usually demanded by high expectancy children; (2) reactive teachers who tend simply to react passively to pupil behavior, thus allowing high expectancy children, by virtue of their initiative and ability, to dominate classroom interaction patterns; and (3) overreactive teachers who not only allow high expectancy children to dominate interaction as a result of their own initiative, but actually exacerbate differences by initiating more interaction with them.

## The Problem

Research investigating aspects of this differential susceptibility phenomenon has not been extensive. The actual number of teachers and contexts represented in the research has been relatively small, and no studies have attempted to identify personal attributes of teachers that are related to differential susceptibility.

The purpose of the present study was two-fold. The major purpose was to investigate relationships between teacher expectations and teacher-pupil interaction. The particular emphasis was to determine whether teachers differ with regard to extent and nature of susceptibility to expectation effects and, if so, to describe such differences. The second purpose was to provide initial investigation into relationships between teacher characteristics and teacher susceptibility to expectation effects.

## Methodology

The following procedures were followed in the conduct of the study:

1. A volunteer samples of six teachers, one at each of the first, third, and sixth grade levels in two schools, was identified for use in the study.

2. Three coders were trained in the use of the Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System.

3. Following a period of familiarization in classrooms, teacher-pupil interaction data were collected at selected times over a two week period.

4. Following the collection of interaction data, teachers were requested to rank students in order of expected achievement. High expectancy children were identified as those ranked in the top one-third of the class. Low expectancy children were identified as those ranked in the bottom one-third of the class.

5. Teacher presage data was collected through the administration of the Sixteen Personality Factor Questionnaire, the This I Believe Test, and the Minnesota Teacher Attitude Inventory. Administrations were carried out following the collection of interaction data.

Analysis

The study required two stages of analysis. In the first stage, relationships between teacher expectations and teacher-pupil interaction were investigated. Measures of teacher-pupil interaction were 33 variables derived from the classroom observation system. Teacher expectations were determined by teacher rankings of pupils. Inductive (t test analysis) and descriptive (individual pupil data and expectancy

group percentages) statistics were used to describe interaction patterns in each of the six classrooms. On the basis of these descriptions, teachers were classified according to extent and nature of susceptibility to expectation effects (i.e., proactive, reactive, overreactive).

In the second stage of analysis, scores obtained on three psychological tests purporting to measure dimensions of personality (16 PF, TIB, MTAI) were used as measures of teacher characteristics and teacher type classifications were used as indices of susceptibility to expectation effects. Teachers were grouped according to type and scores obtained on the above tests were inspected in a search for prima facie evidence of relationships between teacher characteristics and susceptibility to expectation effects. Descriptive procedures were used in this phase of the study.

## CONCLUSIONS

The sample of teachers used in the study was small and voluntary in nature. The findings of the study were based on trends in the data that did not necessarily imply statistical significance. For these reasons, findings for individual teachers must be interpreted cautiously and no generalizations about the population of teachers from which the sample was drawn can be made. The following conclusions, which are based on findings presented and discussed in Chapter 4, must be viewed in the light of these qualifications.

### Teacher Expectations and Teacher-Pupil Interaction

1. The typologies of teaching reaction (i.e., proactive, reactive, overreactive) hypothesized by Brophy and Good (1974) appear

to be appropriate classification for use in research. Although not developed for this purpose, they provide a convenient basis for conceptualizing overall classroom interaction patterns and for grouping teachers for further study. Four of the teachers in the present study were classified according to type. Two were not classifiable. In one case, however, it was for want of sufficient data and in the other it was the reluctance of the researcher to stretch an obviously flexible classification system. Teacher 4 manifested many of the characteristics of the proactive teacher, but the data did not indicate that she was compensating for high expectancy children demanding more of her attention.

2. Differential teacher behavior based on expectations for pupil performance is not universal but is characteristic of some teachers. Thre of the six teachers in the study tended to behave differently toward children on the basis of expectations. Three showed no such inclination. This finding is consistent with findings reported by Evertson, Brophy, and Good (1972; 1973) and Brophy, Evertson, Harris, and Good (1972).

3. When expectation effects are evident, they do not always take the form of teachers favoring high expectancy children. In the present study, two of the three teachers who revealed tendencies toward differential behavior interacted more frequently with low expectancy children. This finding is somewhat at odds with early research in the field. Such research was almost unanimous in reporting that teachers interacted more frequently and more positively with children for whom high expectations were held (see Chapter 2). It receives support,

however, from much of the research in the Brophy-Good tradition. A number of these studies have also reported differences in the direction of expectation effects.

4. The final conclusion relating to this phase of the investigation serves to underscore an observation made by numerous people involved in classroom research (e.g., Rosenshine and Furst, 1973; Dunkin and Biddle, 1974; Berliner, 1976). Namely, that teacher behavior, pupil behavior, and thus teacher-pupil interaction patterns are influenced by a multitude of factors. Expectations for pupil performance appear to be one of these factors but it is obviously not the only one. This fact was illustrated in the present study. Findings revealed that some children experienced interaction with the teacher that was more characteristic of the expectancy group of which they were not a member. Further, within-group interaction patterns were often very discrepant. "Teaching is a very complex set of events that can not be easily understood" (Berliner, 1976, p. 12).

Teacher Characteristics and Differential Teacher Behavior

The major conclusion drawn from this phase of the study was that scores on six dimensions of the Sixteen Personality Factor Questionnaire appear to differentiate teachers according to teacher type (i.e., proactive, reactive, overreactive) and therefore warrant further investigation.

Test scores indicated that the proactive teacher and the overreactive teacher differed from one another in that the former appeared to be more trusting, more adaptable, more concerned about other people, and less involved in her own ego. This finding seems consistent with the

proactive teacher's tendency to devote more time and effort to assuring that children with less potential achieve optimal success.

Test scores also suggest that the proactive teacher and the overreactive teacher were similar to one another and different from the reactive teachers in the following ways:

1. They appeared to be more perceptive and dominated to a greater extent by a sense of duty. Again, this finding might be considered consistent with observed classroom behavior. Both teacher types assume initiative in controlling classroom interaction patterns. Being more perceptive might suggest that they are better able to recognize which children are initiating the most interaction during the rapid flow of classroom events. Being dominated by a greater sense of duty might suggest a reason for their tendency to gain and maintain control of interaction patterns. It is possible that role definition dictates their choice as to whether to afford high or low expectancy children the greater attention.

2. They both scored low on the personality dimension relating to assertiveness and independent-mindedness. Reactive teachers scored high on this dimension. This finding appears somewhat discrepant with what could be expected. It might be, however, that reactive teachers are influenced to some extent by a belief that children should be more assertive in creating interaction opportunity on their own initiative (i.e., be more like themselves). This would help explain why they do not compensate directly for the greater interaction initiated by high expectancy children.

3. They both scored lower on the conservative-experimenting

dimension of personality than did the reactive teachers. Again, this finding appears somewhat discrepant with what might be expected on the basis of classroom interaction patterns.

## RECOMMENDATIONS

There is considerable evidence of a relationship between differential teacher behavior and expectations for individual pupil performance. Knowledge concerning many aspects of this relationship, however, is incomplete. There is need for continued research in the field. Recommendations projected from the present study are discussed in this section.

1. Further research examining the ways teachers communicate performance expectations to children is recommended. Classroom coding systems do not capture all aspects of teacher behavior through which expectations might be communicated. The tone of voice used in asking a question, the amount of time the teacher is prepared to wait for a child's answer, and the multitude of non-verbal messages that teachers transmit to children are examples. It would be useful to combine ethnographic procedures with observation instruments to obtain a more complete description of teacher behavior which has the potential of communicating performance expectations.

2. Teacher presage variables have a poor performance record in educational research. The need to better understand the antecedents of differential teacher behavior, however, dictates that effort in this area continue. The present study produced prima facie evidence of relationships between the nature of differential behavior and dimensions of personality measured by the 16 PF. Studies designed to replicate

these findings seem warranted. It is recommended that large sample studies be conducted in an attempt to further identify personal attributes of teachers which are related to differential behavior.

3. There is a need for research designed to investigate teacher motives underlying differential behavior. It would be valuable to determine whether teachers are aware of behaving differentially and, if they are, what motives they have for such behavior. It would seem inadequate to formulate explanatory theory without direct teacher input. Studies combining classroom observation and open-ended interviews designed to reveal conscious and unconscious motives are recommended.

4. Differential behavior is influenced by factors other than expectations for pupil performance. It would seem that the prediction of such behavior would be enhanced if performance expectations were studied in combination with other factors known or suspected to influence teacher behavior. Some of these factors are implied in recommendations (2) and (3); others might include pupil sex, pupil socio-economic status, pupil attitude toward classroom activity, and a variety of contextual variables. Research using multiple regression techniques and designed to predict differential behavior is recommended.

5. The relationship between teacher expectations and differential behavior is only of concern if it affects children. To date there has been little research designed to examine the effect of differential teacher behavior on pupil attainment. Research in this area is needed. It is recommended that large sample studies be undertaken to investigate the effect of differential teacher behavior on such product measures as academic achievement, self-concept, and attitude toward

school.

6. The final recommendation also relates to the effect of differential behavior. It would appear that such behavior might influence pupil attainment in two ways; directly through the amount of teacher attention afforded the child and indirectly through the child internalizing expecations that are communicated by the teacher. In order for the latter situation to exist, the child must perceive teacher behavior as the communication of performance expectations. To observe teacher behavior and infer that it constitutes communication of performance expectations would seem inadequate. Studies are needed that investigate children's perceptions of teacher classroom behavior. A variety of prcedures might be used. Questionnaire, interview, and stimulated recall techniques are possibilities.

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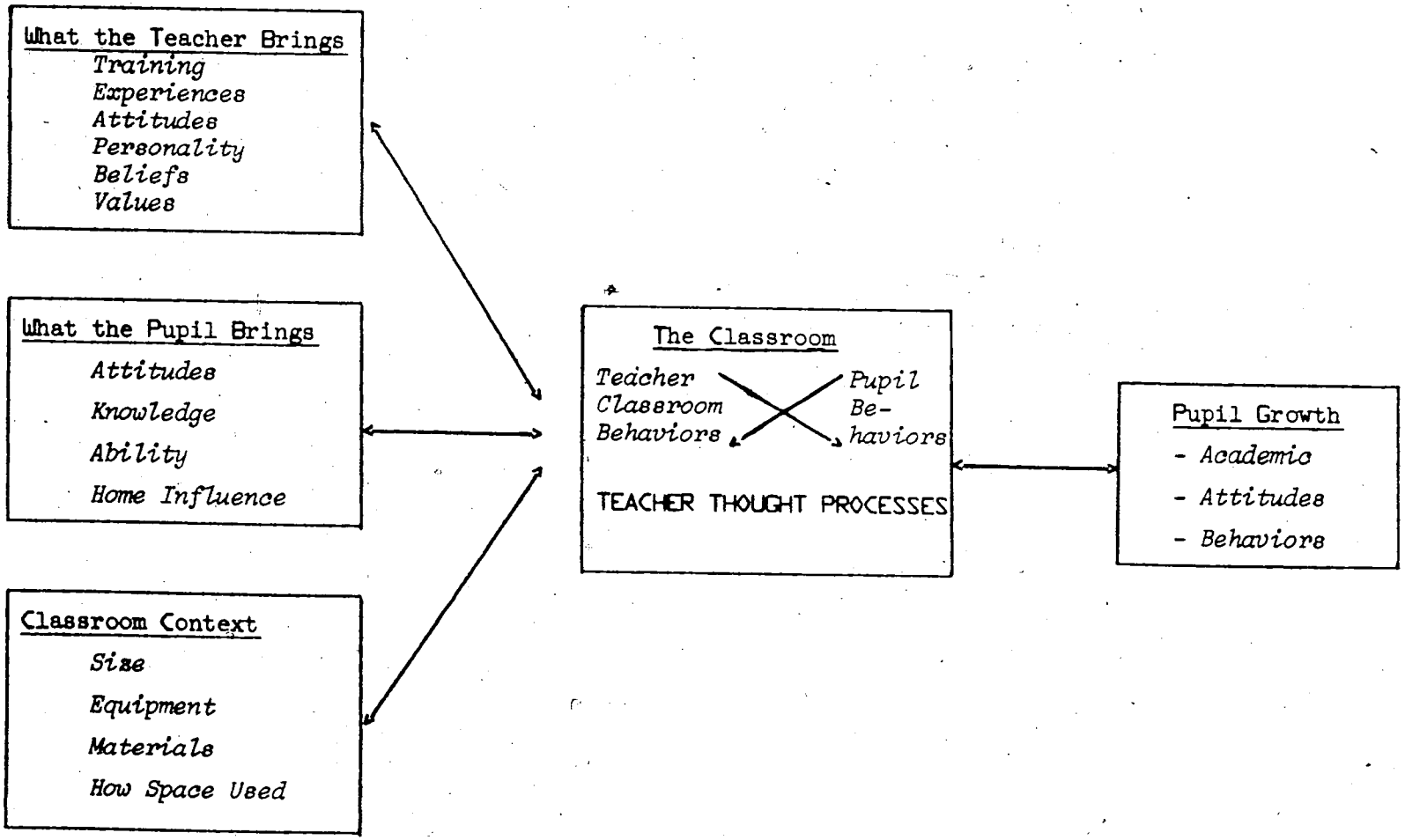
# APPENDICES

# APPENDIX A

## TEACHER HANDOUT: DESCRIPTION OF RESEARCH PROJECT

## THE STUDY OF TEACHING AND LEARNING



Sample Timetable for ONE Teacher

| Week | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 1 | 1 week informal observation for purposes of familiarization | | | | |
| 2 | 1 1/2 hr a.m. observing | 1 hr p.m. observing | | | |
| 3 | | | | | |
| 4 | | | | | |

# APPENDIX B

## DESCRIPTION OF CATEGORIES IN THE CLASSROOM OBSERVATION SYSTEM

Section I. Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

Section II. Definitions of One Modified Category and Two New Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

SECTION I

## Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

The major aspects of classroom life coded by this system are represented by the four cells in the diagram appearing below. Within each cell are the sub-categories of those four aspects which are then further broken down into still smaller units.

| | Public response opportunities | Private dyadic teacher-pupil contacts |
|---|---|---|
| Teacher afforded | A. | C.<br>I. Work-related<br>II. Personal<br>III. Procedure-related<br>IV. Behavior-related<br>V. Don't know |
| Student initiated | B.<br>I. Student Initiated Questions<br>II. Student Initiated Comments | D.<br>I. Work-related<br>II. Personal-related<br>III. Don't know |

A. Teacher Afforded Response Opportunities

The three key aspects of this category of classroom event are:

(a) they are public interactions between the teacher and a child, intended to be monitored by the class or group with which the teacher is working;

(b) they occur when the teacher asks a question requiring either a verbal or nonverbal response;

(c) only one child makes the response.

For each response opportunity that is coded, information has to be checked off in each of four subcategories: (1) type of response opportunity; (2) level of question asked; (3) quality of child's answer; (4) nature of the teacher's feedback reaction.

(1) Types of response opportunity

Predesignated (PRE): teacher names the child first and then asks a question;

Non volunteer (N. VOL): teacher asks a question first but calls for a response from a child who has not raised his hand;

Volunteer (VOL): teacher asks a question first and invites a response from a child with hand raised;

Called out (CALL): teacher asks a question but a child calls out the answer before the teacher has a chance to select a respondent; the teacher nevertheless responds to the child who called out the answer.

(2) Level of question asked

Process (PCSS): question requiring student to integrate facts or show knowledge of their relationships.

Product (PROD): question for which a specific correct answer is sought.

Choice (CHOIS): question requiring an answer to be selected from one of the alternatives presented.

Self Reference (SELF REF): question requiring child to make a non-academic contribution to the classroom discussion. This type of question has then to be further classified as subject-matter related (SUB) or non subject-matter related (NON SUB) and then whether it requires the child to show a preference (PREF) or to give information about his past experience (EXP).

Opinion: question requiring student to take a position on an issue or to predict the outcome of an experiment or hypothetical situation. If the child gives no response (NR) this is coded. On the other hand if the child does respond, the teacher's reaction to

the answer is coded: if it is praised (+), criticized (-), ignored (0), accepted (ACPT), integrated (INTEG into the ongoing discussion, or if the teacher disagrees (DISAG) with the child's opinion.

(3) Quality of child's answer

The child's answer is coded as correct (+), partially correct (±), incorrect (-), or no response (NR) but, if the child indicates that he doesn't know, this item of information is also coded.

(4) Nature of the teacher's feedback response.[1]

The teacher's reaction to the child's response has been categorized as terminal or sustaining. Reaction which is terminal, that is, it has the effect of terminating the interaction with the child, could be one of seven types. The teacher may praise (+), criticize (-), provide no response (NR) give process feedback (CSS), give the correct answer (GIV ANS), ask another (ASK OTH) child for the answer, or the answer may be called out (CALL) by another student. Reaction which is sustaining, that is, it has the effect of prolonging the interaction, could be one of three kinds. The teacher may repeat the question (REPT Q), rephrase the question or give a clue (REP or CLU), or ask a new question (NEW Q).

B. Student Initiated Response Opportunities

I. Student Initiated Questions

This category of response opportunity is used if the student asks the teacher a question regarding the subject matter under discussion or some other matter. If the student calls out (CALL) the question without prior teacher approval, this point is coded and also if the question is relevant (REL) or irrelevant (IRREL). Two kinds of teacher reaction to the question, praise (+) and criticism (-), are coded if they occur, and also types of teacher feedback. The teacher may provide no feedback (0) (i.e. ignore the question), delay (DELAY) her answer, not accept (NACPT) it into the discussion, provide a brief or long answer or she may redirect (RDRCT) the question to another student. Three other categories

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[1] Modifications to the subcategories of teacher feedback as defined in the Expanded Brophy-Good System were made and are reported in Appendix B, Section II.

praise (+), criticism (-), and warning (WARN) are provided if the teacher makes a reaction related to the student's behavior in initiating the question.

II. Student Initiated Comments

The details surrounding a student initiated comment that are coded are very similar to those for a student initiated question. All but three teacher response categories, brief, long, and redirect (RDRCT) are retained. They are replaced by another three. The teacher may accept (ACPT) the student comment, integrate (INTEG) it into the class discussion, or may use it to shift the direction of the class discussion.

C. Teacher Afforded Dyadic Contacts

I. Teacher Afforded Contacts (Work-related)

These are instances when the teacher makes private contact with an individual child about his work. Several features of these contacts are coded. The contact may be long, brief or it may be one in which the teacher just observes (OBSV) without entering into verbal interaction. If the contact is a long or brief one, praise (+) or criticism (-) is coded also if the teacher's comments include such reactions. A don't know (?) category is used if the interaction between teacher and child is not audible to the coder.

II. Teacher Afforded Contacts (Personal)

These contacts do not involve either work content or procedure but are of a strictly personal nature.

III. Teacher Afforded Contacts (Procedure-related)

Within this category a distinction is made between those instances when a teacher seeks a favor (child helps in running the classroom) and those in which the request have to do with getting the child ready to work. The latter are coded as management (MANAG). Thank you (THANKS) is coded if the teacher thanks the child following the management or favor request.

IV. Teacher Afforded Contacts (Behavior-related)

This category is used whenever the teacher makes some comment on the child's classroom behavior. They are subdivided into praise (+), non-verbal intervation (NVI), warnings (WARN), and criticism (-). Errors which the teacher makes when warning a child are also noted. Three kinds of errors, target errors (TARG), timing errors (TIM), and overreactions (OVERT) are coded. The no error category is

used whenever the teacher does not make one of the three errors. Provision also exists for the coder to recrod his uncertainty (?) if he is not sure that an error has occurred.

V. Don't know (?) is coded if the teacher-pupil communication is inaudible to the coder and the coder is unable to determine which of the above four types of teacher afforded contacts is occurring.

D. Student Initiated Dyadic Teacher-Pupil Contacts (referred to as Child Created Contacts on the coding sheets)

I. Child Created Contacts (Work-related)

This type of contact may relate to work content (CONT) or work procedures (PROC). The teacher's feedback to the child is also coded, whether the teacher offers praise (+) or criticism (-), and whether the contact is brief, long, or delayed (DELAY) by the teacher.

II. Child Created Contacts (Personal-related)

In this category there are two first-order divisions, experience (EXP) sharing and procedural (PROC). All experience sharing contacts are personal ones in which the student contacts the teacher to tell him something which is not related to either classroom work or procedure. The teacher's response is coded as either acknowledged (ACK) (i.e. the contact is acknowledged by the teacher) or delay (i.e. the teacher indicates she is unable to listen or talk to the pupil at that time).

A procedural contact occurs when the pupil is making a request, offers to do an errand, or reminds the teacher of something. The teacher's reaction is coded as grant or non-grant (N GRANT) (teacher has or has not granted the request) or as delay.

III. Don't Know

If the communication in the child created contact is inaudible to the coder, the don't know (?) column is used.

SECTION II

## Definitions of One Modified Category and Two New Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

### No Feedback Reaction (0)

This category of terminal teacher reaction in the Brophy-Good system has been restricted in meaning in this study. This part of the original statement now embodies its full meaning.

> "If the teacher makes no response whatsoever following the child's answer to the question, he is coded for no feedback reaction (0). This means that he makes no verbal response to the child and does not communicate affirmation or negation by shaking his head in response to the answer. Instead, he merely moves on to something else, perhaps by starting to make a new point or by asking another child a question. Most coders will be surprised to find that this category is used much more often than they had expected. It frequently happens that the teacher makes no feedback reaction at all to the child's answer, especially in fast moving question drills where he is pushing to get correct answers in an impersonal fashion, without paying attention to the individual child giving the answer" (Brophy & Good, 1970, p. 17).

### Affirmative Teacher Reaction (AFFIRM)

This category of teacher reaction within an academic response opportunity is defined as a terminal teacher reaction which does not go beyond the level of simple affirmation. The teacher simply indicates that the child has given a correct response. He does not communicate a warm personal reaction to the child. There is merely an impersonal communication of information. For example, the teacher repeats the student's answer or thanks the pupil without explicity or implicit praise. The teacher's intent is to terminate student involvement.

### Repeats Student Statement (REP SS)

This is an additional category in the set of teacher reactions in academic response opportunities described as sustaining. In this category are to be coded all those instances when the teacher repeats the child's answer in a quizzical manner without indicating whether he considers it to be correct or incorrect, or when the teacher restates the pupil answer for the purpose of having the student confirm what he had just said. The principal criterion to be used in distinguishing a Repeats Student Statement is whether the teacher's

intention was to sustain the student's involvement by having the pupil clarify for himself and/or for others the meaning of his previous response.

# APPENDIX C

## TEACHER INTERVIEW PROTOCOLS

# Teacher Interview Protocols

## Instructions for Interviewer

The purpose of the teacher interview is to obtain information about certain teacher attitudes and expectations. In particular, it is designed to provide data concerning the teacher's perception of his (her) role as a teacher, his (her) class as a group, and individual pupils within his (her) class.

1. Since the objective of the interview is to discover what the teacher thinks and feels, it is important that the interviewer does not cue the teacher to give "acceptable" answers. the interviewer should be particularly careful to avoid asking leading questions and reacting in a judgemental way to teacher responses.

2. It is important that the teacher feel comfortable about discussing his (her) class and program. To achieve this goal it will be necessary for the interviewer to establish a relaxed, friendly and supportive atmosphere prior to and during the interview.

3. The interviewer will note that most questions have a number of sequential parts. In some cases the teacher will "take off" in response to the initial question and provide answers to subsequent parts. In other cases it will be necessary to work through each part of the question until all information has been obtained. It is important that we obtain complete answers. The interviewer must concentrate on the teacher's communication and allow himself when necessary to depart from the protocol questions for the purpose of satisfying the intent of the question.

4. The interview is to be carried out in two parts. Part I is to be conducted early in the first week of classroom observation. Part II is to be conducted during the final week of data collection, after classroom observation has been completed. Please tape each interview and label the tape according to date, Part I or II, and teacher's name. Please deliver the tape to Dave along with forms A, B, C, and D.

## Interviewers Introduction

In our first interview, you told me a number of things about your class and your program. You might recall, however, that we didn't talk very much about individual children. Today I want to ask you some questions that pertain to individual children.

1. I have three tasks I'd like you to complete relative to the children in your class. They all have to do with giving your impressions of individual children.

a) On this sheet (PROVIDE FORM A) would you rank the children in your class according to the extent to which you think they will achieve in school.

NOTE: The instructions for ranking have been kept deliberately vague to encourage teachers to use their own subjective criteria in making judgements. Should teachers ask about criteria for ranking, the interviewer will indicate that they should base ranking on their own perception of achievement.

b) On this sheet (PROVIDE FORM B) would you now rate each child in accordance with your judgement as to his usual attitude to classroom activities.

c) On this sheet (PROVIDE FORM C) would you now rate each child in accordance with your judgement as to his or her academic ability.

NOTE: As teacher is completing Forms B and C, the interviewer will examine Form A and identify the three students ranked highes and the three students ranked lowest.

2. I notice that you have ranked A, B, and C as highest and X, Y, and Z as lowest in terms of how well you think they will do in school. Could you give me your reasons for these choices?

- What factors entered into your decision?
- What special characteristics do these children possess or lack?
- Do you feel that these are permanent or temporary conditions?
- How long do you feel they will continue to do well or poorly in school?

# F O R M A

Please rank the children in your class according to the extent to which you think they will do well in school.

| | CHILDREN | RANKING |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |
| 15. | | |
| 16. | | |
| 17. | | |
| 18. | | |
| 19. | | |
| 20. | | |
| 21. | | |
| 22. | | |
| 23. | | |
| 24. | | |
| 25. | | |
| 26. | | |
| 27. | | |
| 28. | | |
| 29. | | |
| 30. | | |

F O R M B

ATTITUDES TOWARD CLASSROOM ACTIVITY

Please rate each child by checking the column that indicates his usual reaction to classroom activities. Please comment in any case where you feel your comments would help to give a more complete picture of the child's attitude and reaction.

| | NAME OF CHILD | Enthusiastic | Interested | Passive | Uninterested | Resistant | COMMENTS |
|---|---|---|---|---|---|---|---|
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |
| 16. | | | | | | | |
| 17. | | | | | | | |
| 18. | | | | | | | |
| 19. | | | | | | | |
| 20. | | | | | | | |
| 21. | | | | | | | |
| 22. | | | | | | | |
| 23. | | | | | | | |
| 24. | | | | | | | |
| 25. | | | | | | | |
| 26. | | | | | | | |
| 27. | | | | | | | |
| 28. | | | | | | | |
| 29. | | | | | | | |
| 30. | | | | | | | |

# F O R M C

## ACADEMIC ABILITY

Please rate each child by checking the column that best indicates the child's academic ability. Please comment in any case where you feel your comments would help to give a more complete picture of the child's academic ability.

| | NAME OF CHILD | Very Bright | Bright | Average Ability | Below Average Ability | Dull | COMMENTS |
|---|---|---|---|---|---|---|---|
| 1. | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |
| 16. | | | | | | | |
| 17. | | | | | | | |
| 18. | | | | | | | |
| 19. | | | | | | | |
| 20. | | | | | | | |
| 21. | | | | | | | |
| 22. | | | | | | | |
| 23. | | | | | | | |
| 24. | | | | | | | |
| 25. | | | | | | | |
| 26. | | | | | | | |
| 27. | | | | | | | |
| 28. | | | | | | | |
| 29. | | | | | | | |
| 30. | | | | | | | |

# APPENDIX D

## THIS I BELIEVE (TIB) TEST

Section I. Descriptions of Belief Systems

Section II. Descriptions of Auxiliary Dimensions

## Description of Belief Systems (This I Believe Test)

### System 1

Characterized, according to theoretical notions, by a strong need for structure; rigid adherence to rules, authorities, and values which provide structure; and rejection of environmental inputs which are dissonant with the individual's organized modes of interpretation.

TIB responses tend to be stated in a definite, hard-and-fast manner, showing little doubt in the subject's mind about how he feels. The content shows adherence to norms and practices approved by society or prestige authorities, a negative reaction to rule-breaking, and polarized evaluations. Heavy reliance on authority is demonstrated by highly favorable attitudes toward religion, law, parents, friends. Other people must meet rigid standards of acceptability, operating in terms of the general behavioral principles of the subject. Religion is a highly consisten concern, serving as a base for the belief system in all aspects of life in many cases. This referent t[illegible]ds to elicit the most clear-cut System 1 responses of all the referents.

System 1's often demonstrate strong ingroup-outgroup feelings, express[illegible] intense hostility and negative feelings on the content of some referents. In order to avoid confusion with System 2 responses that appear similar because of their negativity, it is necessary to evaluate such resp[illegible]se[illegible] within the total context of all the responses.

The overall impression of System 1's is that of a person who has definite stands on every topic, states them evaluatively and unequivocally, and rejects things if they do not meet his high standards or ideals of perfection. The reader may feel that this subject is rather hostile toward his environment and other people, but there is an underlying sense of stable acceptance of things as they should (ought, must, etc.) be by his standards. The words, "everything", "all", "completely", "best", "worst", etc., are all words that indicate the extreme, clear-cut, definite aspects of existence as this person sees it. Uncertainty is anathema to a System 1, and both content and structure in his responses demonstrate his drive to reject uncertainty and to find and maintain certainty in his environment.

### System 2

Characterized by terms highly similar to those of System 1 except for a reversal of certain central aspects of content. The structural aspects are similar, and the responses indicate rigidity, simplicity, consistency and exclusivity.

This subject has the same drive for certainty as the System 1, but seems unable to rely on his world to find it. Hence, he seems to obtain certainty by rejecting his world, as though negating it provides his only source of

certainty. The reader will find a rejection of or hostile attitude toward authority referents, idealistic notions, most American standards and values, and most other people. Not all people are rejected, however, since this subject makes positive statements about the underdog, the loner, minority groups and individuality. Conversely, he makes negative statements about elements that might do harm to these people and attributes.

There is a strong rejection of religion, people, government, and, more subtly, ties and obligations and other freedom-restraining devices. This subject reacts negatively to these ideas, yet cannot ignore them. He speaks of the importance of close friendship, but suspects most people to seem to offer it. He tends to be factual and hard-nosed rather than idealistic about the world, requiring a need for structure similar to that observed in the System 1 person.

Overall, the System 2 person appears extremely hostile and rejecting, concrete-minded, non-analytic toward his environment, and a categorical acceptor or rejector in terms of pre-established negativity. His responses may be quite novel, but often they are inappropriately so and thus turn out to be more clever than creative.

System 3

The chief locus of satisfaction for a System 3 tends to be his relation with other people. His responses reflect the central importance of people, and he accepts and voices the values of the people with whom he is in contact at the moment rather than initiating behaviors or expressing beliefs that are contrary to the present group.

TIB responses generally lack any expression of negative feelings. There is a strong tendency to deal with the world through its superficial aspect, expressed in the use of clichés rather than directly. Relationships with people are brought in to the answers even when TIB referents do not necessarily call for them. Generally, the only negative reaction will be to a referent indicating harm or injury to other people.

The responses of these subjects are more complex, varied and abstract than Systems 1 and 2. These people are typically rather sophisticated in dealing with their world and do not demonstrate a hard-and-fast rigidity in responses to the referents. Though the repeated emphasis on interpersonal relations may at first appear to be a rigid response tendency, analysis shows a great deal of flexibility and openness in the System 3's responses, while remaining sensitive to the evidence of person-oriented content. These individuals tend to manifest many distinctions in their thinking, but most of these are based on the "in-thing" and show little integration or synthesis.

The overall impression generated by the responses of System 3 persons is one of a positive attitude toward situations and ideals which are beneficial to people.

System 4

Characterized by relative independence from the environment, greater reliability on internally-derived stimulation, greater flexibility and openness, interest in (even seeking for) novelty, a relative lack of extreme evaluativeness or extreme acceptance-rejection behavior, the tendency to be aware of and to respond to referents in terms of multiple alternatives or interpretations.

TIB responses show a juxtaposition of diverse, often contrasting elements. There is a lack of one-way evaluativeness; certainty and definiteness in commitment to a single way of perceiving a situation are typically not evident in these subjects.

The overall impression of a System 4 person is one of complexity of thought and feeling. Depth of connotative implications rather than superficial statement is most typical of these Ss. They tend to show novelty and appropriateness and to synthesize the many differentiations they make.

Description of Auxiliary Dimensions (This I Believe Test)

1. Openness - by which is meant the respondents' presumed willingness to seriously entertain and possibly accept an idea contrary to his own more central ones.
2. Candor - by which is meant the assumed forthrightness of self-honesty with which a response is made, which implies low denial and low defensiveness.
3. Evaluativeness - which refers to the tendency to make evaluative, good-bad, right-wrong judgements, with obviously pejorative implications.
4. Externality - which refers to the respondents' tendency to attribu success, failure, or control of his actions to forces over which has little or no control, including such things as luck, other pe God, social obstacles, etc.
5. Cynicism - which indicates an expression of nihilism, that nothing matters anyway, and, in general, that the world is a bunch of crap.
6. Optimism - which refers to an assumed feeling of well-being and, in general, that things either have turned out or will turn out well for him/her.
7. Complexity - which has to do with the number of different themes expressed together with their integration, which, in essence, equals a kind of judged profundity or depth of thought.

# APPENDIX E

## CAPSULE DESCRIPTIONS OF THE SIXTEEN PRIMARY AND FOUR SECOND-ORDER FACTORS OF THE SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE (16 PF)

## Capsule Descriptions of the Sixteen Primary Personality Factors

Factor A: Reserved vs. Outgoing

The person who scores low (sten of 1 to 3) on Factor A tends to be stiff, cool, skeptical, and aloof. He likes things rather than people, working alone, and avoiding compromises of viewpoints. He is likely to be precise and "rigid" in his way of doing things and in personal standards, and in many occupations these are desirable traits. He may tend, at times, to be critical, obstructive, or hard.

The person who scores high (sten of 8 to 10) on Factor A tends to be goodnatured, easy-going, emotionally expressive (hence naturally Affectothymia), ready to cooperate, attentive to people, soft-hearted, kindly, adaptable. He likes occupations dealing with people, and socially impressive situations. He readily forms active groups. He is generous in personal relations, less afraid of criticism, better able to remember names of people.

Factor B: Less Intelligent vs. More Intelligent

The person scoring low on Factor B tends to be slow to learn and grasp, dull, given to concrete and literal interpretation. His dullness may be simply a reflection of low intelligence, or it may represent poor functioning due to psychopathology.

The person who scores high on Factor B tends to be quick to grasp ideas, a fast learner, intelligent. There is some correlation with level of culture, and some with alertness. High scores contraindicate deterioration of mental functions in pathological conditions.

Factor C: Affected By Feelings vs. Emotionally Stable

The person who scores low on Factor C tends to [illegible] in frustration tolerance for unsatisfactory conditions, changeable and plastic, evading necessary reality demands, neurotically fatigued, fretful, easily emotional and annoyed, active in dissatisfaction, having neurotic symptoms (phobias, sleep disturbances, psychosomatic complaints, etc.). Low Factor C score is common to almost all forms of neurotic and some psychotic disorders.

The person who scores high on Factor C tends to be emotionally mature, stable, realistic about life, unruffled, possessing ego strength, better able to maintain solid group morale. Sometimes he may be a person making a resigned adjustment* to unsolved emotional problems.

*Shrewd clinical observers have pointed out that a good C level sometimes enables a person to achieve effective adjustment despite an underlying psychotic potential.

Factor E: Humble vs. Assertive

The person who scores low on Factor E tends to give way to others, to be docile, and conform. He is often dependent, confessing, anxious for obsessional c ness. This passivity is part of many neurotic syndromes.

The person w scores high on Factor E is assertive, self-assured, and independent-minded. He tends to be austere, a law to himself, hostile or extrapunitive, authoritarian (managing others), and disregards authority.

Factor F: Sober vs. Happy-go-lucky

The person who scores low on Factor F tends to be restrained, reticent, introspective. He is sometimes dour, pessimistic, unduly deliberate, and considered smug and primly correct by observers. He tends to be a sober, dependable person.

The person who scores high on this trait tends to be cheerful, active, talkative, frank, expressive, effervescent, care-free. He is frequently chosen as an elected leader. He may be implusive and mercurial.

Factor G: Expedient vs. Conscientious

The person who scores low on Factor G tends to be unsteady in purpose. He is often casual and lacking in effort for group undertakings and cultural demands. His freedom from group influence may lead to anti-social acts, but at times makes him more effective, while his refusal to be bound by rules causes him to have less somatic upset from stress.

The person who scores high on Factor G tends to be exacting in character, dominated by sense of duty, persevering, responsible, planful, "fills the unforgiving minute". He is usually conscientious and moralistic, and he prefers hard-working people to witty companions. The inner "categorical imperative" of this essential superego (in the psychoanalytic sense) should be distinguished from the superficially similar "social ideal self" of $Q_3$+.

Factor H: Shy vs. Venturesome

The person who scores low on this trait tends to be shy, withdrawing, cautious, retiring, a "wallflower". He usually has inferiority feelings. He tends to be slow and impeded in speech and in expressing himself, dislikes occupations with personal contacts, prefers one or two close friends to large groups, and is not given to keeping in contact with all that is going on around him.

The person who scores high on Factor H is sociable, bold, ready to try new things, spontaneous, and abundant in emotional response. His "thick-skinnedness" enables him to face wear and tear in dealing with people and grueling emotional situations, without fatigue. However, he can be careless of detail, ignore danger signals, and consume much time talking. He tends to be "pushy" and actively interested in the opposite sex.

Factor I: Tough-minded vs. Tender-minded

The person who scores low on Factor I tends to be practical, realistic, masculine, independent, responsible, but skeptical of subjective, cultural elaborations. He is sometimes unmoved, hard, cynical, smug. He tends to keep a group operating on a practical and realistic "no-nonsense" basis.

The person who scores high on Factor I tends to be tender-minded, day-dreaming, artistic, fastidious, feminine. He is sometimes demanding of attention and help, impatient, dependent, impractical. He dislikes crude people and rough occupations. He tends to slow up group performance, and to upset group morale by unrealistic fussiness.

Factor L: Trusting vs. Suspicious

The person who scores low on Factor L tends to be free of jealous tendencies, adaptable, cheerful, un-competitive, concerned about other people, a good team worker.

The person who scores high on Factor L tends to be mistrusting and doubtful. He is often involved in his own ego, is self-opinionated, and interested in internal, mental life. He is usually deliberate in his actions, unconcerned about other people, a poor team member.

Factor M: Practical vs. Imaginative

The person who scores low on Factor M tends to be anxious to do the right things, attentive to practical matters, and subject to the dictation of what is obviously possible. He is concerned over detail, able to keep his head in emergencies, but sometimes unimaginative.

The person who scores high on Factor M tends to be unconventional, unconcerned over everyday matters, Bohemian, self-motivated, imaginatively creative, concerned with "essentials", and oblivious of particular people and physical realities. His inner-directed interests sometimes lead to unrealistic situations accompanied by expressive outbursts. His individuality tends to cause him to be rejected in group activities.

Factor N: Forthright vs. Shrewd

The person who scores low on Factor N tends to be unsophisticated, sentimental, and simple. He is sometimes crude and awkward, but easily pleased and content with what comes, and is natural and spontaneous.

The person who scores high on Factor N tends to be polished, experienced, worldly, shrewd. He is often hardheaded and analytical. He has an intellectual, unsentimental approach to situations, and approach akin to cynicism.

Factor O: Placid vs. Apprehensive

The person who scores low on Factor O tends to be placid, with unshakable nerve. He has a mature, unanxious confidence in himself and his capacity to deal with things. He is resilient and secure, but to the point of being insensitive of when a group is not going along with him, so that he may evoke antipathies and distrust.

The person who scores high on Factor O tends to be depressed, moody, a worrier, full of foreboding, and brooding. He has a childlike tendency to anxiety in difficulties. He does not feel accepted in groups or free to participate. High Factor O score is very common in clinical groups of all types.

Factor $Q_1$: Conservative vs. Experimenting

The person who scores low on Factor $Q_1$ is confident in what he has been taught to believe, and accepts the "tried and true", despite inconsistencies, when something else might be better. He is cautious and compromising in regard to new ideas. Thus, he tends to oppose and postpone change, is inclined to go along with tradition, is more conservative in religion and politics, and tends not to be interested in analytical "intellectual" thought.

The person who scores high on Factor $Q_1$ tends to be interested in intellectual matters and has doubts on fundamental issues. He is skeptical and inquiring regarding ideas, either old or new. He tends to be more well informed, less inclined to moralize, more inclined to experiment in life generally, and more tolerant of inconvenience and change.

Factor $Q_2$: Group-dependent vs. Self-sufficient

The person who scores low on Factor $Q_2$ prefers to work and make decisions with other people, likes and depends on social approval and admiration. He tends to go along with the group and may be lacking in

individual resolution. He is not necessarily gregarious by choice; rather he needs group support.

The person who scores high on Factor $Q_2$ temperamentally independent, accustomed to going his own way, making decisions and taking action on his own. He discounts public opinion, but is not necessarily dominant in his relations with others (see Factor E). He does not dislike people but simply does not need their agreement or support.

Factor $Q_3$: Undisciplined Self-conflict vs. Controlled

The person who scores low on Factor $Q_3$ will not be bothered with will control and regard for social demands. He is not overly considerate, careful, or painstaking. He may feel maladjusted, and many maladjustments (especially the affective, but not the paranoid) show $Q_3$-.

The person who scores high on Factor $Q_3$ tends to have strong control of his emotions and general behavior, is inclined to be socially aware and careful, and evidences what is commonly termed "self-respect" and social reputation. He sometimes tends, however, to be obstinate. [redacted] leaders, and some paranoids, are high on $Q_3$.

[redacted] $Q_4$: Relaxed vs. Tense

The person who scores low on Factor $Q_4$ tends to be sedate, relaxed, composed, and satisfied (not frustrated). In some situations, his oversatisfaction can lead to laziness and low performance, in the sense that low motivation produces little trial and error. Conversely, high tension level may disrupt school and work performance.

The person who scores high on Factor $Q_4$ tends to be tense, excitable, restless, fretful, impatient. He is often fatigued, but unable to remain inactive. In groups he takes a poor view of the degree of unity, orderliness, and leadership. His frustration represents an excess of stimulated, but undischarged, drive.

## Capsule Descriptions of Four Second-order Personality Factors

### Factor $Q_I$: Introversion vs. Extraversion

The person who scores low on Factor $Q_I$ tends to be shy, self-sufficient, and inhibited in interpersonal contacts. This can be either a favorable or unfavorable finding, depending upon the particular situation in which the person is expected to function; e.g., introversion is a favorable predictor of precision workmanship.

The person who scores high on this factor is a socially outgoing, uninhibited person, good at making and maintaining interpersonal contacts. This can be very favorable in situations that call for this type of temperament, e.g., salesmanship, but should not be considered necessarily favorable as a general predictor, e.g., of scholastic achievement.

### Factor $Q_{II}$: Low Anxiety vs. High Anxiety

The person who scores low on this factor tends to be one whose life is generally satisfying and one who is able to achieve those things that seem to him to be important. However, an extremely low score can mean lack of motivation for difficult tasks, as is generally shown in studies relating anxiety to achievement.

The person who score high on this factor is high on anxiety as it is commonly understood. He need not be neurotic, since anxiety could be situational, but it is probable that he has some maladjustment, i.e., he is dissatisfied with the degree to which he is able to meet the demands of life and to achieve what he desires. Very high anxiety is generally disruptive of performance, and productive of physical disturbances.

### Factor $Q_{III}$: Tenderminded Emotionality vs. Tough Poise

The person who scores low on Factor $Q_{III}$ is likely to be troubled by pervasive emotionality, and may be of a discouraged, frustrated type. He is, however, sensitive to the subtleties of life, likely to be artistic and rather gentle. If he has problems, they often involve too much thought and consideration before action is taken.

The person who scores high on this factor is likely to be an enterprising, decisive, and resilient personality. However, he is likely to miss the subtle relationships of life, and to orient his behavior too much toward the obvious. If he has difficulties, they are likely to involve rapid action with insufficent consideration and thought.

Factor $Q_{IV}$: Subduedness vs. Independence

The person who scores low on Factor $Q_{IV}$ is a group-dependent, chastened, passive personality. He is likely to desire and need support from other persons, and likely to orient his behavior toward persons who give such support.

The person who scores high on this factor tends to be an aggressive, independent, daring, incisive person. He will seek those situations where such behavior is at least tolerated and possibly rewarded, and is likely to exhibit considerable initiative.

# APPENDIX F

## INTERCODER RELIABILITY MEASURES OBTAINED DURING TRAINING WITH THE LAW INFERENCE CLASSROOM OBSERVATION SYSTEM

Intercoder Reliability Measures Obtained During Training with the Low Inference Classroom Observation System

| Variable | Check No. | Percentage Agreement: Coders 1 & 2 | | | | | Coders 1 & 3 | | | | | Coders 2 & 3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Academic Response Opportunity | | | | | | | | | | | | | | | | |
| Type of Respondent | | 82 | 100* | 70 | --† | -- | 82 | 70 | 55 | -- | -- | 80 | 70 | 78 | -- | -- |
| Question Type | | 73 | 75 | 71 | -- | -- | 36 | 100 | 33 | -- | -- | 30 | 75 | 33 | -- | -- |
| Child Answer | | 85 | 80 | 64 | -- | -- | 69 | 89 | 58 | -- | -- | 64 | 80 | 78 | -- | -- |
| T. Feedback on PCSS, PROD,CHOIS | | 43 | 67 | 50 | -- | -- | 60 | 78 | 71 | -- | -- | 60 | 67 | 78 | -- | -- |
| T. Feedback on Opinion Q's | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Student Initiated Question | | | | | | | | | | | | | | | | |
| Type | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Relevancy | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| T. Feedback | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Student Initiated Comment | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| Relevancy | | 100 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| T. Feedback | | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| Dyadic Contact | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | 65 | 86 | 64 | -- | -- | 76 | 92 | 64 | -- | -- | -- | -- |
| Child Created Contact (CCC) | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | 90 | 83 | 0 | -- | -- | 87 | 95 | 0 | -- | -- | 96 | 75 |
| CCC (WK-REL) | | | | | | | | | | | | | | | | |
| T. Reaction (DELAY, BRIEF, LONG) | | 100 | -- | -- | 79 | 86 | 0 | -- | -- | 100 | 88 | 0 | -- | -- | 79 | 78 |
| T. Reaction (‡, =) | | -- | -- | -- | -- | 56 | -- | -- | -- | -- | 45 | -- | -- | -- | -- | 78 |
| CCC (PERS-REL) | | | | | | | | | | | | | | | | |
| Type | | -- | -- | -- | 25 | 50 | -- | -- | -- | 43 | 50 | -- | -- | -- | 50 | 75 |
| T. Reaction (ACK, DELAY) | | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 100 | -- | -- | -- | -- | 0 |
| T. Reaction (GRANT, NONGRANT) | | -- | -- | -- | 25 | 33 | -- | -- | -- | 43 | 0 | -- | -- | -- | 50 | 0 |
| Teacher Afforded Contact (TAC) | | | | | | | | | | | | | | | | |
| Type | | 89 | -- | -- | 45 | 73 | 58 | -- | -- | 60 | 92 | 57 | -- | -- | 71 | 73 |
| TAC (WK-REL), | | | | | | | | | | | | | | | | |
| Type (OBSV, BRIEF, LONG) | | -- | -- | -- | 31 | 60 | -- | -- | -- | 32 | 50 | -- | -- | -- | 59 | 67 |
| T. Reaction (‡, =) | | -- | -- | -- | 33 | -- | -- | -- | -- | 33 | -- | -- | -- | -- | 100 | -- |
| TAC (PROC-REL) | | | | | | | | | | | | | | | | |
| Type (MANAG, FAVOR) | | 78 | -- | -- | 56 | 33 | 78 | -- | -- | 78 | 100 | 100 | -- | -- | 45 | 33 |
| TAC (BEH-REL) | | | | | | | | | | | | | | | | |
| Type (‡, NVI, WARM, =) | | 0 | -- | -- | 67 | 60 | 20 | -- | -- | 57 | 50 | 0 | -- | -- | 71 | 33 |
| Error Type | | 0 | -- | -- | 67 | 60 | 20 | -- | -- | 57 | 50 | 0 | -- | -- | 71 | 33 |

*Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

†A dash in a cell represents 100% agreement between coders that the event did not occur.

# APPENDIX G

## INTERCODER RELIABILITY MEASURES OBTAINED DURING DATA COLLECTION WITH THE LOW INFERENCE CLASSROOM OBSERVATION SYSTEM

Intercoder Reliability Measures Obtained during Data Collection with the Low Inference Classroom Observation System

| Variable | Check No. | Percentage Agreement: Coders 1 & 2 | | | Coders 1 & 3 | | | | | | Coders 2 & 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 |
| **Academic Response Opportunity** | | | | | | | | | | | | | | |
| Type of Respondent | | 50* | 85 | --† | 20 | 50 | 33 | 79 | 0 | -- | 50 | 91 | 71 | -- |
| Question Type | | 88 | 86 | -- | 33 | 55 | 50 | 83 | 33 | -- | 77 | 89 | 82 | 33 |
| Child Answer | | 50 | 85 | -- | 33 | 52 | 33 | 89 | 100 | -- | 50 | 90 | 75 | -- |
| T. Feedback on PCSS, PROD, CHOIS | | 50 | 73 | -- | 25 | 66 | 33 | 74 | 100 | -- | 39 | 76 | 69 | -- |
| T. Feedback on Opinion Q's | | -- | -- | -- | 0 | 18 | 100 | 100 | -- | -- | -- | 60 | -- | -- |
| **Student Initiated Question** | | | | | | | | | | | | | | |
| Type | | [illegible] | -- | -- | -- | 50 | 0 | 57 | 100 | 43 | 33 | -- | -- | 40 |
| Relevancy | | 72 | -- | -- | -- | 50 | 33 | 71 | 50 | 60 | 33 | -- | -- | 60 |
| T. Feedback | | 63 | -- | -- | -- | 50 | 33 | 71 | 100 | 29 | 33 | -- | -- | 80 |
| **Student Initiated Comment** | | | | | | | | | | | | | | |
| Type | | 33 | 0 | 100 | 67 | 50 | 50 | 42 | 71 | 40 | 43 | 40 | 20 | 50 |
| Relevancy | | 45 | 0 | 100 | 50 | 50 | 29 | 56 | 75 | 60 | 71 | 80 | 100 | 44 |
| T. Feedback | | 56 | 0 | 100 | 33 | -- | 27 | 13 | 57 | 100 | 71 | 60 | 60 | 44 |
| **Dyadic Contact** | | | | | | | | | | | | | | |
| Type | | 84 | 100 | 73 | 67 | 20 | 56 | 85 | 88 | 83 | 73 | 56 | 83 | 89 |
| **Child Created Contact (** | | | | | | | | | | | | | | |
| Type | | 62 | -- | 69 | 100 | 0 | 39 | 40 | 81 | 80 | 100 | 0 | 100 | 80 |
| CCC (WK-REL) | | | | | | | | | | | | | | |
| T. Reaction (DELAY, BRIEF, LONG) | | 56 | -- | 41 | 75 | -- | 29 | 50 | 79 | 67 | 0 | 0 | 100 | 71 |
| T. Reaction (+, -) | | -- | -- | -- | -- | -- | 100 | -- | -- | 0 | -- | -- | -- | -- |
| CCC (PERS-REL) | | | | | | | | | | | | | | |
| Type | | [illegible] | -- | 17 | -- | 0 | 20 | 0 | 58 | 38 | 0 | -- | 100 | 50 |
| T. Reaction (ACK, DELAY) | | -- | -- | 0 | -- | 0 | 20 | -- | 33 | 33 | 0 | -- | -- | 0 |
| T. Reaction (GRANT, NONGRANT) | | 0 | -- | 20 | -- | -- | -- | 0 | 33 | -- | 0 | -- | 100 | 20 |
| **Teacher Afforded Contact (TAC)** | | | | | | | | | | | | | | |
| Type | | 76 | 100 | 74 | 59 | 22 | 42 | 77 | 90 | 55 | 67 | 43 | 80 | 85 |
| TAC (WK-REL) | | | | | | | | | | | | | | |
| [illegible] OBSV, BRIEF, LONG) | | 46 | -- | 33 | 25 | -- | -- | 67 | 83 | 50 | -- | -- | 60 | 40 |
| [illegible]tion (+, -) | | -- | -- | -- | 0 | -- | -- | -- | 43 | 60 | -- | -- | -- | 100 | |
| [illegible]REL) | | | | | | | | | | | | | | |
| [illegible]MAG, FAVOR) | | 56 | -- | 50 | 60 | 22 | 33 | 100 | 88 | 20 | 100 | 0 | 100 | 89 |
| TAC [illegible]EL) | | | | | | | | | | | | | | |
| [illegible], NVI, WARN, -) | | 0 | 100 | 0 | 20 | 0 | 40 | 50 | 50 | 50 | 0 | 57 | 50 | 50 |
| Error Type | | 0 | 100 | 0 | 60 | -- | 33 | 50 | 78 | 50 | 0 | 45 | 100 | 50 |

*Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

†A dash in a cell represents 100% agreement between coders that the event did not occur.