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STUDENTS' PERCEPTIONS OF
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IS THERE A COMMUNICATION GAP?

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# STUDENTS' PERCEPTIONS
# OF
# TEACHERS' INTRODUCTIONS TO TASKS:
# IS THERE A COMMUNICATION GAP?

By

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## DEDICATION

This work is dedicated to my father,

P. D. Kher

and

my husband,

S. Durlabhji.

They have always supported

and

encouraged

my pursuit of learning.

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# CHAPTER I

# INTRODUCTION

## The Problem

Research on teacher effectiveness often focuses on the question: How do teachers bring about desired student outcomes? In the past, researchers have sought to answer questions about teacher effectiveness by conducting naturalistic studies of classrooms where teacher behaviors are related to measures of student outcomes. Such approaches assumed the classroom as a "black box" (Gage, 1963) where the input consisted of teachers, pupils, hardware and software and the output was "more or less pupil learning." (Dunkin & Biddle, 1974). See reviews on this topic by Brophy (1979) and Good (1979, 1983).

One major criticism of the above mentioned approach to research on teacher effectiveness has been that it lacks concern for contextual effects. As Dunkin and Biddle (1974) point out, "It is possible, of course, that some qualities may make for effectiveness of teaching regardless of the context. But others, perhaps the majority, will be context related. And if we are to evaluate the effectiveness of teachers, train teachers for their specific jobs, or assign teachers to schools and curricula where they will be most effective, it would be wise to take contextual information into account." (p. 15)

In the last decade researchers have become aware of this shortcoming and have begun to develop new ways of studying teacher effects that are less likely to treat the classroom as a "black box," and more cognizant of the complexities of daily classroom life. As Brophy (1980) points out, "One of the major contributions of the research of the 1970's was its attention to context factors that can influence the appropriateness or effectiveness of particular teacher behaviors. . . Few of these context factors have been studied yet, and none have been investigated systematically.

When investigators do study such context factors, however, they almost invariably report significant differences in what constitutes effective teaching in the different contexts studied." (p. 8-9)

One line of research that has contributed to "attention to context factors" focuses on how teachers' effects are mediated by students. The researchers thereby, acknowledge that teacher behaviors (presentation of material, attempts to motivate students, etc.) do not influence all students in the same way. Peterson's (1983) conclusion that student engagement and achievement are related when student self report of attending is the index of engagement but that the two variables (student engagement and student achievement) are not related when student engagement is coded by the observers, lends support to the notion that students' perceptions mediate teacher effects. For each student the outcome is mediated by his/her background, previous classroom experiences, effort at attending, and so on. This concern with student variables (student mediating processes) is reflected in the research of Anderson (1981), Doyle (1979), Peterson and Swing (1984), Rohrkemper (1984), and Winne and Marx (1977).

Recent research has also been concerned with the notion that a class is not an undifferentiated homogeneous group, but may in fact be composed of several diverse groups. In the past, the diverse nature of groups tended to be ignored because the group was usually defined in terms of the classroom. Recently, however, research has focused on exploring variations in student outcomes and student perceptions among subgroups of students (Anderson, 1981; Rohrkemper, 1981; Weinstein & Middlestadt, 1979). As Rohrkemper (1981) points out: "Interest has shifted, then, from an interest in central tendency data typical of earlier investigations, to an interest in uniqueness." (p. 2)

Statement of the Problem

In a recent study of teacher effects, Brophy, Rohrkemper, Rashid, and Goldberger (1983) investigated the relationship between teachers' presentation of classroom tasks (teacher behavior) and students' subsequent engagement in those tasks (student outcomes). That study was based on the premise that what teachers say about tasks affects the degree to which they are perceived as interesting, challenging, or worthwhile. Specifically, the comments teachers made about tasks were thought to influence the students' motivation to engage in those tasks. The analysis of the relationship between statements which teachers made about classroom tasks in the process of presenting the tasks to the students, and the degree of observed student engagement, indicated some unexpected results. In keeping with the researchers' expectations, student engagement declined following teacher presentation statements that portrayed tasks in a negative light. However, there was no parallel tendency for student engagement to be high following teachers' communications that presented tasks positively. Engagement was highest when teachers launched directly into tasks, with no introductions. One reason for the lack of any relationship between positive task presentation and high student engagement may have been the contexts within which teachers presented the tasks positively. Teachers may have portrayed tasks positively only when they had reason to believe that student motivation might be a problem. Secondly, the incentives (motivators) used by the teachers may not have appealed to the students. Thirdly, students may not have accepted teachers' positive statements at face value. The students may have discounted or questioned the motives behind their teachers' positive task presentations. The possibility that such perceptions might mediate and dilute teachers' intended effects has been alluded to in the literature (Brophy, 1981; Meyer, Bachmann, Biermann, Hempelmann, Ploger, and

Spiller, 1979). Thus, it is suggested that students, by the time they reach the middle grades, learn to be skeptical about teachers' attempts to develop motivation for classroom tasks

Some additional data from the Brophy et al. (1983) study are yet to be analyzed and might provide answers to some of the questions raised by the unexpected results mentioned above. However, these additional data do not include information about the students' perceptions of teachers' introductions to tasks.

Students' perceptions of situations in which teachers launch directly into tasks without making any introductions might explain the positive relationship between student engagement and the absence of introductions by the teacher. When a teacher launches directly into the task, do the students use this as a cue to attend to the task more closely? Perceptions and interpretations of classroom events vary with individuals and their roles in the classroom. In the Brophy et al. (1983) study, observers' reports were used to interpret classroom events. Clark and Creswell (1978) and Weinstein and Middlestadt (1979) have suggested that observers and students differ in their perceptions and interpretations of classroom events. Thus, students' views might provide important information about the effects of teachers' communications.

Children's perceptions about aspects of life relevant to them are often very different from the perceptions of adults. This has been corroborated by Yamamoto (1979) in a study assessing the degree of stress involved in different childhood experiences. Further, research also indicates that there are differences of viewpoint between what teachers and students consider rewarding (Ware, 1978). The differences between what is considered motivating by teachers and students respectively (leading consequently, to higher engagement in tasks) might explain some of the unexpected results of the

Brophy et al. (1983) study.

Research also indicates that children's perceptions of what is motivating change with age. There are age related changes in reward preferences for reinforcers which vary along dimensions such as "immediate/delayed" and "concrete/symbolic" (Harter, 1967; Harter & Zigler, 1974; Mischel & Metzner, 1962; Nisan, 1974; Van Treese, 1982; Walls, 1973; Weisz, 1978). Age related changes are also found in research studying the effects of different types of reward on children's interest/engagement in a task (Sarafino & Stinger, 1981). Thus, student age would be a relevant variable to consider when studying students' perceptions of teachers' introductions to tasks.

Research on teacher expectations has raised questions as to whether individual differences may influence children's perceptions of the events that convey academic expectations. Sex differences have been documented in patterns of attributions of success and failure to causes (Dweck, Davidson, Nelson, & Enna, 1978; Lenney, 1977); also differences between low and average achievers (Bond & Johnson, 1979). However, sex and achievement level differences were not found to influence children's perceptions of differential treatment by the teacher toward high and low achievers (Weinstein, 1981). Given the conflicting nature of the findings, research on students' perceptions needs to consider variations in achievement history which may influence students' perceptions of classroom events. This study therefore investigates individual differences in perceptions.

## Research Objectives

Conceptually, the study can be divided into three major parts. Within each part, there are several objectives. 1. The first objective is to determine whether there are differences in students perceptions of task introductions

made by teachers. If differences do exist, how are they manifested in preferences for various kinds of introductions to tasks that are made by the teachers and in the reasons given for these preferences?

a. Are there any age-related changes in students' preferences for teachers' introductions to tasks and in the reasons given for their preferences?

b. To what extent do student characteristics such as achievement level and sex affect students' preferences and their reasons for these preferences?

c. Are students' preferences and the reasons for the preferences related to the frequency with which teachers are likely to use introductions similar to the ones presented to the students in the study?

2. The second research objective is to obtain students' perceptions of situations in which the teacher launches into the task directly without any introduction.

a. Are there any age-related changes in students' perceptions of these situations?

b. To what extent do student characteristics such as achievement level and sex mediate the students' perceptions of these situations?

3. The third research objective concerns obtaining information from the students about things that their teachers could say or do to make them work hard (be engaged in the task).

a. Are there age level differences in students' perceptions of the kinds of things that teachers could say or do to make them work hard?

b. To what extent do the achievement level and sex of the students mediate their perceptions of the things that teachers could say or do to make them work hard?

## Potential Contributions

This study has the potential to contribute to the field of research on effective teaching and to enable us to generate guidelines which could help teachers in motivating students to engage in academic tasks. It will help answer some of the questions raised by the Brophy et al. (1983) study, and provide guidelines for future research in this area.

The results of this study can have a great deal of practical utility for teachers. Teachers are concerned about effective ways of motivating students to engage in academic tasks. Strategies which are often suggested to teachers do not account for the differential perceptions of those strategies by students. This study, by discovering students' preferences for certain kinds of motivational statements, and their rationales for such preferences, can provide teachers with guidelines indicating which motivational principles are effective, and under what conditions, and their differential effectiveness with different subgroups of students.

## Chapter Summary

In this chapter, the purpose of the dissertation was stated. The statement of the problem was presented within the context of a brief overview of the relevant literature. The research objectives were explicated and the chapter concluded with description of the potential contributions of the study to the field of research on teaching and to the practice of teaching.

The next chapter is a more extensive review of the relevant literature.

# CHAPTER TWO

## REVIEW OF THE LITERATURE

This chapter is divided into three sections. The first section focuses on the importance of students' perceptions in research on teaching. The second section delineates the mediational role of students' perceptions in the study of teacher effects. The third section focuses on the factors that influence students' task engagement.

## IMPORTANCE OF STUDENTS' PERSPECTIVES

In this section, an attempt is made to show that students' perceptions of events relevant to them are often very different from the perceptions of adults. Further, issues related to developmental differences and individual differences in students' perceptions are explored. Finally, a distinction is made between actual student outcomes and intended student outcomes (the difference being due, in part, to differential perceptions of teacher behaviors by the students).

### Differences in Perceptions of Children and Adults

Children's perceptions about aspects of life relevant to them are often very different from the perceptions of adults. Most of the early research on teaching ignored students' perceptions of classroom events or inferred them from accounts provided by teachers, observers, school psychologists, or parents (Van Treese, 1982). Surveys and interview data on children's concerns indicate that their attitudes, feelings, and opinions differ from commonly held adult beliefs.

Yamamoto (1979) gathered children's assessments of the degree of stress involved in different childhood experiences. Fourth, fifth, and sixth grade students rated 20 life events on a seven-point scale. No differences were found

by grade, sex, or actual personal experiences, but children's assessments varied from clinicians' judgments in some respects. Children rated the birth of a sibling as the "least stressful" of the 20 events listed, whereas the clinicians typically viewed a new sibling as a critical stress point in a child's life. This clearly indicates a difference between the perceptions of children and clinicians.

Clark and Cresswell (1978) indicate that there are differences in perspectives of students and observers concerning the nature and meaning of classroom events. They report that students perceive the non-verbal behavior of the teacher to be more encouraging of learners than do classroom observers. This difference may be indicative of the historical totality of students' experiences with the teacher; however, it does not preclude the possibility that the students and observers may be attending to different behavioral cues (or drawing different inferences from the same cues).

Research also indicates differences between what teachers and students consider rewarding. Ware's (1978) study of most valued rewards from the perspective of both students and teachers revealed that the relationship between what teachers consider rewarding to students and what students themselves consider rewarding, is a negative one. Students ranked personal kinds of recognition high whereas teachers preferred tangible kinds of recognition. The marked differences in the perceptions of teachers and students are illustrated by the finding that the top two rewards on the teachers' list are the bottom two on the students' list.

## Developmental Differences in Children's Perceptions

Recent investigations of the development of children's social perceptions have two major goals: 1) to support Piaget's claim that preoperational children

do not attend to intentional cues and instead fixate on consequence or outcome when judging another's actions; or 2) to refute this position with the contention that the differences, if they exist, between the social judgments of adults and those of children are quantitative rather than qualitative, resulting from gradual differentiation. This position is exemplified by Werner (1948).

Piaget's theory is the starting point for many of these studies. Piaget's contention that preoperational children are unable to perceive intention in others due to their egocentrism, which inhibits their taking of another's perspective, is supported by Flavell, Botkin, Fry, Wright, and Jarvis (1968). Researchers who support this view see a parallel between acquisition of the knowledge of causality in the physical realm and knowledge of others' motives, needs, and desires in the social realm. Thus, the child's ability to decenter in logical problem solving is considered important for social problem solving.

However, Keasey (1977) suggests that this might be an oversimplification of Piaget's position. According to Keasey, Piaget states that children as young as three and four do in fact know about intentions, but this information is often ignored in favor of a salient outcome. This "centering" on the outcome could be due to the child's early socialization experiences. Piaget's distinction between "active" and "theoretical" moral thought is pertinent here. Active moral thought concerns those dilemmas which are part of the child's real life experiences. This domain differs from the theoretical in the level of specificity and concreteness. Theoretical moral thought, which is more abstract, generalized, and principle-governed, is thought to lag behind active moral thought in development.

This distinction between domains of moral thought enables us to make sense of the contradictory findings of studies which differ in their emphasis on ecological validity. Thus, significant differences are typically found in

relatively abstract experimental situations, especially if the stimulus materials involve adults (rather than children) in unusual situations (Appel, 1977; Eisenberg-Berg, 1979; Kurdek, 1977). However, the results of studies that focus on ecological validity and concreteness of stimulus materials (in form and content) typically do not indicate that young children (age 4+) ignore intentions in evaluating social interactions (Berndt, 1977; Dodge, 1980; Keasey, 1977; Kun, 1978; Shantz, 1975).

There are, however, deviations from the general relationships between ecological validity and developmental trends (Calveric, 1979; Smith, 1978; Whiteman, 1967). These researchers' findings may be due to the difficulty of the tasks which the subjects undertook (although the situation was realistic). Thus, results obtained may be due to the confounding of ability, motivation, strain on memory capacities, etc. (Berndt, 1977). Further, developmental differences have also been found due to the children's use of simplifying strategies to counteract memory overload (Berg-Cross, 1975), to ordering effects (Austin, Ruble, & Trabasso, 1977), and to recency effects (Kurdek, 1978). Developmental differences are also related to the degree of inference required of the subject in using stimulus materials (Sedlak, 1979). If enough information is not provided to create a proper contextual backdrop, there is a greater likelihood of differing task interpretations.

Developmental differences in children's perceptions are also linked to the cognitive strain inherent in the response criteria. Thus, the greater the cognitive strain, the greater the likelihood of finding developmental differences. Cognitive limitations could therefore influence children's social perceptions (as recorded in particular studies).

The aim of the present study is to assess students' reactions to pairs of task introduction statements made by teachers, and to elicit reasons for their

preferences. The content of the statements focus on children's "active" rather than "theoretical" thought. The introduction to the interview process and the warm-up are designed to provide an adequate contextual background, thus minimizing differing interpretation of stimulus materials. The stimulus materials (teacher statements) are typical of those heard by elementary students, and so their ecological validity is enhanced.

Research also indicates that children's perceptions of what might be motivating changes with age. There is evidence to suggest that there are age related changes in preferences for reinforcers which vary along dimensions such as "immediate/delayed" and "concrete/symbolic" (Harter, 1967; Harter & Zigler, 1974; Mischel & Metzner, 1962; Nisan, 1974; Van Treese, 1982; Walls, 1973; Weisz, 1978). Older children prefer symbolic rewards to concrete rewards and also prefer delayed to immediate gratification. Age-related changes are also found in research studying effects of different types of reward on children's interest/engagement in tasks (Sarafino & Stinger, 1981). One of the objectives of the present study is to see how students perceive those task introductions by teachers that are intended to serve as motivators. The students' age would be a relevant variable to include in the design of the study.

Individual Differences in Children's Perceptions

Developmental differences are one source of variation in children's perceptions. Research indicates, however, that differences may also be due to factors such as sex or social class. Koopman and Schroeder (1977), in a questionnaire assessing children's perceptions of their teacher's behavior, found that differences in children's perceptions were related to sex, SES, and behavior of children (delinquents, maladjusted normals, normals). Yarrow and Campell (1963) also found social perceptual differences according to subgroups

(withdrawn, active, friendly, and hostile aggressive children). In a recent study Dodge (1980) examined differences in use of intention attribution as a function of different levels of aggression in children.

Research on teacher expectations has also investigated the influence of individual differences in children's perceptions of events that communicate academic expectations. Dweck, et al. (1978) and Lenney (1977) reported sex differences and differences between low and high achievers in attributions made for success and failure regarding performance expectations. However, sex and achievement levels were not found to influence children's perceptions of differential treatment by the teacher toward low and high achievers (Weinstein, Marshall, Brattesani, & Sharp, 1980). Given the conflicting nature of the findings, further research on students' perceptions needs to account for the variation in achievement history which may influence the perceptions of classroom events.

Further, Walberg (1976) indicates that appropriate analysis of student perception data is through the formation of meaningful subgroups of children (such as boys and girls; high and low achieving students) and the use of those subgroups as units of analysis. If classroom means were treated as units of analysis, they would mask the possibility that different environments exist for subgroups within one classroom setting and that these differences are perceived by the children. Several recent classroom investigators provide support for analyzing data by subgroups (Weinstein et al., 1980, Stipek & Tannat, 1984; Cooper & Good, 1984). These concerns are reflected in the design of this study. Students are not only classified by grade but also by sex and achievement level (high and low achievers).

Differences in Actual and Intended Effects

In the preceeding paragraphs of this section, research evidence was presented to point out that children's perceptions of events relevant to their lives are often opposed to adult perceptions of those events. Further, differences in children's perceptions could also be attributed to developmental and individual difference variables.

Researchers on teacher effectiveness have, until recently, ignored the possibility that students' perceptions of teacher behaviors could mediate student outcomes (A review of the literature on the mediational role of students' perceptions is provided in the next section). Due to differential student perceptions of teacher behaviors, there are differences between the intended student outcomes and actual student outcomes. Research on teachers' use of praise indicates that there is a difference between intended and actual effects of praise on the student.

Praise by the teacher of successful performance or good conduct is frequently advocated by educational psychologists and other experts for reinforcing or motivating students. However, Brophy (1981) found that teacher praise failed to correlate with other classroom process variables or outcome variables in ways that it would if praise were functioning as reinforcement. Also, much of teacher praise is "reactive to and under the control of student behavior rather than vice versa." Further, praise clearly serves more functions than just reinforcement. Brophy enumerates eight different functions (e.g., praise as spontaneous expression of surprise or admiration, praise as balance for criticism or vindication for predictions/expectations, praise as ice breaker or peace offering, praise as student elicited stroking, etc.). A number of these functions would be clearly at odds with the reinforcer function of praise. Thus, praise communicates different things in a diversity of contexts.

Are students able to perceive these differences in praise? Meyer, et al. (1979) hypothesized that praise and criticism provide information about others' perceptions of an acting person's ability, depending on the context in which the praise or criticism occurs. In their study, subjects were given descriptions of two students who had obtained identical results at a task of a particular difficulty level. One of the students received neutral feedback and the other was praised for success or criticized for failure. The results indicated that praise following success or neutral feedback after failure led to the perception that the acting person's ability was low, and that neutral feedback after success and criticism after failure led to the perception that the acting person's ability was high. These results were typical for adult subjects but partially supported for children as well. This study clearly indicates differential perception of praise depending on the circumstances in which it is delivered. It further illustrates the discrepancy between intended effects and actual effects.

Brophy et al. (1983) also suggested that there might be a difference between actual and intended effects in a study measuring the relationship between teachers' presentations of classroom tasks and their students' subsequent engagement in those tasks. A major premise of that study was that comments teachers make about tasks in the process of introducing tasks affect the degree to which the students perceive the tasks as interesting, challenging, or worthwhile. These comments are then likely to influence the students' motivation to engage in those tasks. The relationship between statements that teachers made about classroom tasks in the process of presenting them to the students and the degree of observed student engagement in those tasks was analyzed. The results of the data analysis were unexpected. Final analyses revealed that student engagement was highest when teachers launched directly into tasks without any introduction. In keeping with the researchers'

expectations, student engagement tended to be low following teacher presentation statements that portrayed tasks in a negative light. However, there was no parallel tendency for student engagement to be high following positive task presentations. Several alternative explanations are offered for these unexpected findings. One reason for the lack of the expected relationship between positive task presentation and high student engagement may be the context in which positive task presentations are made. Teachers may take time to portray tasks more positively when they have reason to believe that student motivation may be a problem. Secondly, students may not be accepting teachers' positive task statements at face value. In effect, the students may be discounting or questioning the motives behind teachers' positive task presentations. The possibility of such perceptions on the part of students, which dilute teachers' intended effects, was previously mentioned in the area of teacher praise (Brophy, 1981; Meyer, 1979). This alternative hypothesis might also help to explain the results of the Brophy et al. (1983) study.

Section Summary

In summary, research indicates that children's perceptions of events relevant to them are often very different from perceptions of adults. Issues related to developmental differences and individual differences in students' perceptions are explored. Finally, research evidence is presented to show that differential student perceptions of teacher behaviors dilute the intended effects of teacher behaviors.

## MEDIATIONAL ROLE OF STUDENTS' PERCEPTIONS

This section elaborates on the growing concern among researchers on teaching over the inadequate attention paid to the mediational role of student perceptions. Further, research evidence is presented to show that students do perceive teacher behaviors and teaching events, that these perceptions are related to students' subsequent achievement, and that students' perceptions of teaching behaviors lead them to engage in specific cognitive processes.

### Student Perceptions as Mediating Variables

In the last decade, researchers of teacher effectiveness have recognized that traditional process-product research did not account for the complexities of classroom life. Several researchers have argued for the need to study student variables, especially student mediating processes, in order to determine the effects of teaching. Doyle (1979) contends that, "There is a growing body of evidence that students have a significant impact on determining the response opportunities they receive, the roles they will assume in the classroom group, and the way teachers behave. Such findings need to become an integral part of interpretive work in research on teaching and more attention should be given to determining how reciprocity moderates classroom effects." (p. 187)

Berliner (1976), in his summary of "Impediments to the study of teacher effectiveness" focused on the issue of student mediating processes and conveyed two basic messages. The first was that "we are now convinced that the mediating link so necessary to consider is a students' active time on task" (p. 10) and the second was that" . . . some variables thought to be quite important by educational psychologists are in fact unimportant to, unperceived, or imperceivable by students." (p. 11)

If students' perceptions are to be characterized as mediating variables,

one needs to establish that 1) students do perceive the occurrences of specific teacher behaviors/instructional events; 2) students' perceptions of the occurrence of teacher behaviors influence their subsequent achievement; and 3) students understand that teacher behaviors/events are intended to engage students in specific cognitive processes (Winne & Marx, 1980).

Do Students' Perceive Occurrences of Teacher Behaviors?

Many areas of research on teaching provide evidence that students do perceive occurrences of teacher behaviors/instructional events. In an experimental study on the effects of teachers' use of structuring, soliciting, and reacting behavior, Winne (1977) (also see Clark, Gage, Marx, Peterson, Stayrook, & Winne, 1979) used the method of "aptitude by treatment interactions" to investigate the kinds of factors that influenced whether students noticed their teacher's use of the above-mentioned behaviors. Results indicated that students' perceptions of teacher behaviors were related to the actual occurrence of those behaviors and were also related to students' aptitudes. For instance, when considering the group of behaviors subsumed under the dimension of teacher reacting, students' attitudes toward the subject matter, their general ability, and the degree to which the teacher displayed reacting behavior predicted the extent to which students perceived their teacher to be engaging in those behaviors. Thus, student aptitudes (student outcomes) were influenced not only by teacher behaviors, but also by students' perceptions of those behaviors.

In another study, Weinstein, Middlestadt, Brattesani, & Marshall (1980) reported that students perceived their teacher to use several specific behaviors differentially with high and low achieving students. The students perceived that low achievers received more negative feedback from teachers than did

high achievers. The students also perceived that their teacher provided more choices to high achievers in accomplishing their academic tasks and comunicated that more was expected of high achievers in their academic activities. The two studies mentioned above indicate that students recognize the occurrence of specific teacher behaviors displayed in the classroom.

Do Students' Perceptions of Teacher Behaviors Influence their Subsequent Learning?

Research indicates that students' perceptions of occurrence of teacher behavior do influence their subsequent achievement. Stayrook, Corno, and Winne (1978) used path analysis to establish causal links between students' aptitudes, occurrences of specific teacher behavior, students' perceptions of those behaviors, and subsequent student learning. They reported that aside from the effects of students' aptitudes and teachers' behaviors on subsequent achievement, students' perceptions of teacher behaviors also had a direct causal link with their achievement. They further reported that "the mediating effect of student perceptions may be behavior-specific for structuring and reacting, it seems that such perceptions do act as mediating variables, but this is not the case for soliciting." (Stayrook, Corno, & Winne, 1978, p. 55)

Do Students' Perceptions of Teacher Behaviors Influence their Cognitive Processing?

Research also provides evidence that students' perceptions of teacher behaviors leads them to engage in specific cognitive processes. The research of Morine-Dershimer and Fagal (1980) and Morine-Dershimer and Galluzzo (1980) is relevant on this point.

Morine-Dershimer and her colleagues videotaped students participating in

short lessons and later interviewed the students using the process of stimulated recall, using the videotapes as stimuli. From these data, researchers were able to categorize students' understanding of behaviors such as the use of particular kinds of questions and the functions of teacher praise. Their results suggest that students' understanding of teacher behavior such as teacher questions or praise signal to the student that s/he needs to be engaged in certain cognitive processes.

### Section Summary

To summarize, researchers in the field of teacher effectiveness need to incorporate student perceptions as a mediating variable in the research paradigm. Recent research has suggested not only that students perceive occurrences of teacher behaviors, but also that their perceptions influence their subsequent learning. Further, students' understanding of teacher behaviors cues them to engage in specific cognitive processes.

## DETERMINANTS OF STUDENT ENGAGEMENT IN TASKS

In this section, literature related to the factors influencing students' engagement in tasks is reviewed. The factors that are elaborated on are student characteristics, teaching strategies, "signal systems," classroom management, and teachers' communications of expectations.

### Factors Influencing Task Engagement

Several studies have linked students' task engagement (also referred to as "time on task" or "attention to task") to gains in achievement (e.g., see Bloom, 1976; Cobb, 1972; Denham & Lieberman, 1980; Hoge & Luce, 1979; Hops & Cobb, 1974; Rosenshine & Berliner, 1979; Samuels & Turnure, 1974; Stallings & Kaskowitz, 1974). Research indicates that there are multiple determinants of

students' task engagement: achievement level of students, teaching strategies used by teachers, "signal systems" (Kounin & Doyle, 1975) inherent in instructional activities, teachers' classroom management strategies, and expectations communicated by the teachers. Relevant research related to these various determinants of students' task engagement is reviewed in the following section.

## Relationship Between Student Characteristics and Students' Task Engagement

Student characteristics such as achievement level influence students' attention to the task (task engagement). High achieving students stay on task more often than low achieving students (Good & Beckerman, 1978). High achieving students are likely to complete tasks independently and then be off-task, while low achieving students delay completing tasks through off-task behaviors (Rusnock & Brandler, 1979; Smyth, 1979).

## Relationship Between Teaching Strategies and Students' Task Engagement

Individual differences in students is one factor that influences students' on-task behavior. Teaching strategies used by teachers in the process of instruction also influence the students' on-task behaviors. McKenzie and Henry (1979) found that students were more engaged in tasks during group lessons when all students gave overt, non-verbal responses to each question (e.g., pointing to individual desk maps) than during lessons when each student was asked a question publically at a large map.

Teachers' strategies for selecting students during discussion could also influence attentiveness and active participation in the task (Anderson, 1981). When the teacher only selects volunteers, the students who do not volunteer are

likely to be inattentive or off-task. However, if the teacher solicits contributions from all the students regularly, there is greater on-task behavior from the students.

Relationship Between "Signal Systems" and Students' Task Engagement

"Signal systems" inherent in instructional activities influence students' engagement in those tasks (Kounin & Doyle, 1975; Kounin & Gump, 1974; Kounin & Sherman, 1979). Signal systems are arrangements of settings or procedural elements within tasks that have the ability to elicit and sustain attention and participation. Kounin and his associates have identified three characteristics of signal systems that are associated with students' on-task behaviors: continuity of signal emission (e.g., reading books or playing recordings to encircling children is continuous, but unrehearsed role-play is discontinuous and relies upon "multiple and shifting" signal sources); insulation (e.g., protection from distraction due to the self-reinforcing nature of the activity, such as individual construction projects where the student has all the necessary materials); and intrusiveness (e.g., materials that have the potential for eliciting inappropriate or deviant behaviors, such as lessons containing movement and music performance or singing. The props or actions are potentially intrusive and could elicit high off-task behavior). Kounin and his colleagues found that students exhibited higher levels of on-task behavior during lessons that were characterized by a higher degree of continuity, greater insulation and minimal intrusiveness.

Relationship Between Classroom Management and Students' Task Engagement

Research on classroom management also suggest ways that teachers' behaviors can influence student attention. Kounin (1970) has identified several

ways in which teachers can create and maintain an atmosphere conducive to students' on-task behavior. Work by Anderson, Evertson, and Emmer (1980) and Emmer, Evertson, and Anderson (1980) provides guidelines that teachers could use to instruct students on how and when to attend to the teacher.

## Relationship Between Teachers' Communication of Expectations and Students' Task Engagement

Teachers' communications with students could also influence students' on-task behavior. Teacher communications convey consistent beliefs, attitudes, and expectations which could influence the degree to which students attend to tasks. If teachers' communications convey expectations, then these communications could have self-fulfilling prophecy effects on student outcomes (Rosenthal & Jacobson, 1968). Since issues related to communication of teacher expectations are of major concern in the Brophy et al. (1983) study, and therefore also in the present study, these issues will be explored in detail in the following paragraphs.

Recent research in the area of teacher expectations has been directed toward delineating the components of the causal process underlying self-fulfilling prophecy phenomena (Braun, 1976; West & Anderson, 1976). This causal process which was explicated by Brophy and Good (1974) and expanded upon by Braun (1976) included the following factors in the causal sequence: 1) teacher input factors (possible sources of teacher expectations, differential susceptibility of teachers to input information); 2) teacher output factors (teacher behaviors that convey expectancy cues); and 3) learner output factors (learner responses to expectancy cues, learner self-expectations, and learner performance). Since teacher and learner output factors are the components relevant to this study, only research related to those components is reviewed.

Teacher- Output Factors

Teachers differ in their general expectations for success or failure in teaching the curriculum to students and these expectations affect the ways in which they teach their students (Good & Dembo, 1973). Thus, they could affect the ways in which tasks are presented to the students.

Teacher attributes such as warmth and enthusiasm have shown consistently positive relationships with student achievement. Reviews of teacher effectiveness literature bear this relationship out (Rosenshine, 1970; Rosenshine & Furst, 1971). These attributes also tend to produce better affective responses from their students and thus contribute to more positive classroom atmospheres (Baird, 1973; Kleinfeld, 1972; Sears & Hilgard, 1964). Teacher enthusiasm is reflected in teacher communications to students while they are introducing tasks.

Teacher communications while presenting tasks is one way in which expectations are conveyed. Good and Brophy (1978, 1980) point out that self-fulfilling prophecy effects may occur with respect to any student outcome about which teachers convey consistent beliefs, expectations, and attitudes, thereby suggesting that teacher communications reflect beliefs and attitudes, which in turn affect student outcomes.

Learner Output Factors

Classroom expectancy literature has recently begun to incorporate learners' perspectives in testing hypotheses related to self-fulfilling prophecy effects. Entwisle and Hayduk (1978) measured children's academic expectations. Weinstein and Middlestadt (1979) investigated whether students perceive differential treatment of high and low achievers by the teacher. The relationship between classroom characteristics and perceived differential

teacher treatment was investigated by Marshall, Weinstein, Middlestadt, and Brattesani, 1980). Children's views about achievement in school were studied by Weinstein, Marshall, Brattesani, and Sharp (1980). Children's perceptions of their academic competence is investigated by Stipek and Tannatt (1984). The student perspective is also incorporated in Cooper and Good's (1984) study of students' ratings of differential teacher treatment.

The recent study by Brophy et al. (1983) was based on the premise that the nature of teachers' communications about tasks (teacher output factors), especially comments made in the process of introducing tasks to the students, should affect the degree to which students perceive the tasks to be interesting, challenging or worthwhile (learner output factors). The comments teachers made about tasks were thought to influence the students' motivation to engage in those tasks. The analysis of the relationship between statements teachers made about classroom tasks in the process of introducing tasks to the students and the degree of observed student engagement indicated some unexpected results. Final analyses revealed that student engagement was highest where teachers launched directly into tasks, with no introduction. In keeping with the researchers' expectations, student engagement declined following teacher presentation statements that portrayed tasks in a negative light. However, there was no parallel tendency for student engagement to be high following teachers' communications that presented tasks positively. These results are contrary to what might be expected from the theory of self-fulfilling prophecy (Rosenthal & Jacobson, 1968). However, the Brophy et al. (1983) study attempted to establish a relationship between teacher behaviors (introductions to tasks) and student outcomes (engagement in tasks) without considering the mediational effects of student perceptions. Three of the alternative hypotheses offered for the unexpected results of the Brophy et al. (1983) study were that

teachers portrayed tasks positively only when they had reason to believe that students' motivation might be a problem; students discounted or negatively interpreted teachers' positive statements; and incentives used by the teachers were not appealing to the students. Thus, the intended effects of teachers' statements were not observed in the study. The present study attempts to investigate one of these alternative hypotheses: the extent to which students' perceptions of teachers' introductions to tasks reflect discounting or negative interpretation of teachers' statements.

## Section Summary

In summary, students' engagement in tasks (on-task behavior) is influenced by student characteristics, teaching strategies used by teachers, the nature of the "signal system" emitted by the academic setting, teachers' strategies for classroom management and the kinds of expectations that teachers communicate to the students. In order to study the relationship between teacher behavior and students' task engagement, the mediational role of students' perceptions of teachers' behavior needs to be considered.

## Chapter Summary

In this chapter the author reviewed literature related to the present study. The first line of research that was reviewed focused on the importance of students' perceptions in research on teaching; the second on the mediational role of students' perceptions in the study of teacher effects; and the third on the factors that influence students' engagement in academic tasks.

# CHAPTER THREE

# METHODS AND PROCEDURES

## Introduction

This chapter on methods and procedures consists of five sections.. The first identifies the population and sample and describes how they were selected for the study. The second section presents the design employed and addresses the issues of internal and external validity. The third section includes a presentation of the instruments used to measure students' perceptions and a discussion of the validity of the instruments. The fourth section describes the procedures used in data collection, and the fifth describes the analysis procedures. Finally, a distinction is made between meaningful and statistical significance for the purposes of this study.

## POPULATION AND SAMPLE

### Population

The theoretical population for this study is elementary school children in second, fourth, and sixth grades, from working-class backgrounds.

### Sample and Selection Procedures

The sample consisted of 96 students, 32 from each of the grade levels of interest. Within each grade, half of the students were male and half female, and within each sex, half of the students were high achieving students and half low achieving students. Teachers (N=8) who taught the 96 students also participated in the study. All subjects volunteered to participate in the study. Teachers supplied consent forms to the students' parents (see Appendix A).

Principals from two schools in the Lansing School District were personally contacted to request the use of their students and teachers for participation in the study. After the study was approved by the Lansing School District Office of Evaluation and the Human Subjects Committee at Michigan State University, the principals of the two schools were contacted again to explain the extent of the teachers' and students' involvement in the study (see Appendix B).

The author and a research assistant working on the project met with the teachers in a group to explain the rationale for the study, describe the extent of the teachers' participation, and answer teachers' questions or alleviate any concerns regarding the study.

The study was explained in complete detail to the teachers because there was no deception involved in the process of data collection and no reason to believe that such knowledge could bias the results. Further, a detailed explanation of the rationale and procedures of the study were thought to be effective in eliciting the teachers' cooperation and enthusiasm for participation. All of the teachers consented to participate in the study (see Appendix C).

The 96 students (32 per grade level) were selected on the basis of their achievement level. Teachers were asked to rank-order the students in their class along three dimensions: their achievement in mathematics, how hard they worked at the subject, and how much they liked it (see Appendix D).

Teachers' rank ordering of students' achievement level in mathematics was used to divide the students into high, medium, and low achieving groups (within each class). Equal numbers of boys and girls were selected from the high and low achieving groups in each class at second, fourth, and sixth grade levels.

There was a five-percent substitution rate for the student subjects. Three

of the subjects were substituted because of parental denial of permission. One subject was substituted because she had a severe emotional impairment and was unable to complete the interview. Another subject had severe speech problems and was also unable to complete the interview. In summary, the subjects consisted of 96 students from the second, fourth, and sixth grades. Within each class of the specified grade level half of the students were male and half female, within sex, half the students were high achieving and the other half low achieving.

## DESIGN OF THE STUDY

The study was designed to investigate elementary school students' perceptions of task introductions made by teachers when giving assignments.

As previously alluded to in the review of literature, different perceptual environments exist for chidren at different age levels and also for subgroups of children within each grade level. The study is thus designed to reflect the author's concern with differential perceptions among groups of children.

The study employs a 3X2X2 fixed effects design, with three grade levels as the first factor, two achievement levels as the second factor, and two levels of sex as the third factor. Table 3.1 presents the independent variables. Table 3.2 presents the control variables and indicates the level at which each is fixed.

Table 3.3 is a schematic representation of the design of the study. The independent variables are fully crossed. For part of the study, a fractional design was employed. The rationale for the fractional design, which makes each subject a half replicate, is presented in a later section.

The study was cross-sectional in design. When studying age-level differences, the most appropriate design would be longitudinal in nature. However, according to Baldwin (1960), longitudinal studies are most appropriate

Table 3.1. Independent Variables

| | | |
|---|---|---|
| Grade Level (G) | Fixed | 2nd, 4th, 6th |
| Achievement Level (A) | Fixed | High, Low |
| Sex (S) | Fixed | Male, Female |

Table 3.2. Control Variables

| | |
|---|---|
| Subject Matter | Mathematics |
| Assignment | Problems on pages 37 and 39 |

Table 3.3. Design of the Study

| | $G_1$ | | $G_2$ | | $G_3$ | |
|---|---|---|---|---|---|---|
| | $A_1$ | $A_2$ | $A_1$ | $A_2$ | $A_1$ | $A_2$ |
| $S_1$ | $R_1^4/R_1^8$ | | | | | |
| $S_2$ | | | | | | |

NOTE: $R_1^4/R_1^8$ means that for part of the study a fractional design is employed with four replications (8 half replicates) per cell. For other parts of the study there are eight replications per cell

$G_1 \ldots G_3$ indicate 2nd, 4th, and 6th grades

$S_1 \ldots S_2$ indicate males and females

$A_1 \ldots A_2$ indicate low and high achievers

in the study of processes that are "relatively uninfluenced by the disturbances found in the normal life of the child." (p. 25) This study deals with children's perceptions of certain kinds of normal classroom events, which are very likely to be influenced by the context in which they are perceived. Further, it is exploratory in nature. Given these factors, a cross-sectional design can provide meaningful information about age-related differences in children's perceptions.

Threats to Internal Validity

Cox (1958) states that an experiment, to be internally valid, must meet the following criteria:

1. At the outset, all groups should be equivalent (best accomplished by random assignment).

2. During the process of the experiment, the groups should differ only along the dimensions of the treatment.

In this study, given the nature of the independent variables, students could not be randomly assigned to groups. Grade level, sex of student, and achievement level of the study were classificatory in nature, and hence not available for random assignment. However, to assure that these classificatory variables were not confounded with interviewer effects and the effects of different forms of the interview, the interview forms (for Part 3) and interviewers were randomly assigned to students within each cell.

In order to meet Cox's second criterion, two measures were explicitly built into this study. At the close of each interview, the interviewers suggested to the student that the interview was a "secret" between them. To check if there was any information provided to other students about the study, the interviewers, in informal conversation with the students, checked out whether they had "heard" anything about the contents of the study. This informal

check revealed that students were generally unaware of the nature of the interview. Further, teachers who participated in the study were instructed not to provide any information to the students other than that they would "be helping some people from Michigan State University."

Threats to External Validity

Threats to external validity represent limitations of the effects of the treatment to a specified set of conditions and are considered constraints to generalizability. According to Campbell and Stanley (1966) the threats to this study would be interaction of treatment with selection, and possible reactive arrangements.

Interaction of selection and treatment pertains to the specificity of the obtained results to the sample employed, and the likelihood that the same result may not be representative of some more general universe of which the group was a sample. The teachers and administrators of the two schools were continuously supportive of our research efforts. In the past, these schools have been equally cooperative with our research endeavors. For this reason, the schools and the classes may not be representative of others throughout the state, but in many other ways, these are typical elementary schools.

The selection of high and low achieving students does limit the generalizability of this study. This study does not address the students who are "middle achievers." Further, generalization is limited to elementary school children because of the scope of this study.

Reactive arrangements may have occurred because of the artificiality of the interview setting. Students were taken to a secluded room to be interviewed. To minimize the effects of being in a novel setting, students were allowed to become satiated with the surroundings before the interview began.

## INSTRUMENTATION

The interview instrument was designed to answer the following questions:

1. How do students react to different kinds of introductions to tasks?

2. Do the students accept teachers' statements at face value, or do they discount teachers' attempts at motivating them?

3. How do students perceive teachers' launching into tasks without any introduction?

4. If, as the results of the Brophy et al. (1983) study indicate, students are not highly engaged in tasks when they are introduced positively, what could teachers say or do to make them work harder?

The instrument used to interview the students consisted of three parts: a series of paired comparisons, and two open-ended questions. These parts of the instrument are explained in the following sections.

### Teacher Statements.

The comparisons were generated from 12 teacher statements (see Appendix E), each of which reflected a different way of introducing the assignment. These statements were very similar to those recorded by classroom observers in the previous study by Brophy et al. (1983). In that study, the teachers' statements were categorized into one or more of 18 categories (see Table 3.4).

These categories were classified as positive, neutral, or negative, based on two criteria: 1) expectations generated about the task itself; and 2) expectations generated about the consequences of success or failure on the task. Table 3.5 presents the classifications of these categories. The positive statements used in this study are fairly balanced in terms of representing statements based on both classifications. Since in the Brophy et al. (1983) study, the relationship between positive task introductions and student

Table 3.4. The 18 Categories for Coding Teachers' Introductory Statements About Tasks.

Category

1. None (teacher launches directly into the task with no introduction)
2. Cues effort (urges students to work hard)
3. Continuity (teacher notes relationship between this task and previous work students have done)
4. Recognition (teacher promises that students who do well on the task will be recognized with symbolic rewards, hanging up of good papers in the classroom, etc.)
5. Extrinsic reward (teacher promises reward for good performance)
6. Threats/punishment (teacher threatens negative consequences for poor performance)
7. Accountability (teacher reminds students that the work will be carefully checked or that they will be tested on the material soon)
8. Time reminder (teacher reminds students that they only have limited time to get the assignment done so they had better concentrate)
9. Embarrassment (teacher tries to show the importance of the tassk to the students, but does this in a negative way, indicating that they are likely to be embarrassed at some time in the future if they do not learn the skills involved)
10. Apology (teacher apologizes to the students for foisting this task on them)
11. Cues negative expectation (teacher indicates directly that the students are not expected to like the task or to do well on the task)
12. Challenge/goal setting (teacher sets some goal or challenges the class to try to attain a certain standard of excellence)

13. Teacher personalizes (teacher expresses personal beliefs or attitudes directly, or tells the students about personal experiences that illustrate the importance of this task)
14. Teacher enthusiasm (teacher directly expresses his or her own liking for this type of task)
15. Self actualization value (teacher suggests the students can develop knowledge or skill that will bring pleasure or personal satisfaction)
16. Survival value (teacher points out that students will need to learn these skills to get along in life or in our society as it is constructed presently)
17. Personal relevance--other (teacher makes some other kind of statement that tries to tie the task to the personal lives or interests of the students)
18. Cues positive expectation (teacher states directly that the students are expected to enjoy the task or to do well on it)

Table 3.5. Brophy et al.'s Classification of the 18 Statement Categories

| Classification Based on Task Itself | Classification Based on Consequences | Categories |
|---|---|---|
| Neutral | Neutral | 1. None |
| Neutral | Neutral | 2. Cues effort |
| Neutral | Neutral | 3. Continuity |
| Neutral | Positive | 4. Recognition |
| Neutral | Positive | 5. Extrinsic Reward |
| Neutral | Negative | 6. Threat/Punishment |
| Neutral | Negative | 7. Accountability |
| Neutral | Neutral | 8. Time Reminder |
| Neutral | Negative | 9. Embarrassment |
| Negative | Neutral | 10. Apology |
| Negative | Neutral | 11. Cues Negative Expectation |
| Neutral | Neutral | 12. Challenge/Goal Setting |
| Positive | Neutral | 13. Teacher Personalizes |
| Positive | Neutral | 14. Teacher Enthusiasm |
| Positive | Positive | 15. Self Actualization Value |
| Neutral | Positive | 16. Survival Value |
| Positive | Positive | 17. Personal Reference - Other |
| Positive | Neutral | 18. Cues Positive Expectation |

engagement was not clear cut, this study focused mainly on statements that were classified as positive. Hence, 75 percent of the statements used here were "positive" statements.

The relationship between negative task introductions and student engagement in the Brophy et al. (1983) study was as expected, and only two negative statements were therefore included in the present study. The rationale for including the negative statements was as follows: 1) they were frequently used by the teachers observed in the Brophy et al. (1983) study and hence were ecologically valid; 2) information about the student perceptions of these negative statements would be meaningful in interpreting results of this study; and 3) data from pilot tests of this study suggested that some negative statements are actually preferred to neutral statements. The two neutral statements were also included in the study for the above mentioned reasons. Table 3.6 presents the statements and their classification according to the Brophy et al. (1983) coding scheme.

In order to focus on the motivational content of each teacher statement, the task is the same in all statements (pages 37 and 39 of the math book). In order to minimize students' making inferences about subject matter, all statements have a math focus. Thus, subject matter and assignment are control variables in the study. A math focus was chosen because the statements could be used across the grade levels without making changes in the assignment. Since the assignment was referred to as "problems," this was understood without further elaboration by students of all grade levels.

## Rationale for Paired Comparisons

Students' reactions to the 12 teacher statements were extensively pilot-tested using a variety of open-ended and unstructured interview formats.

Table 3.6. Classification of Teacher Presentation Statements Used in this Study

| Statement No. | Category Code | Classification | Basis of Classification | Statement |
|---|---|---|---|---|
| 1 | 16 | Neutral | Consequences | It's important that you know these skills. You'll need them for math next year. |
| 2 | 14 | Positive | Task | I like these kinds of problems and I think you'll enjoy them too. |
| 3. | 12,18 | Positive | Task | Page 37 should be no trouble at all, but the ones on page 39 are harder. You'll have to think before you do them. |
| 4 | 4 | Positive | Consequences | If you do a really good paper, I'll put it up on the bulletin board. |
| 5 | 16 | Positive | Consequences | It's important that you know these skills. You'll need them when you go grocery shopping or to the bank |
| 6 | 5 | Positive | Consequence | If you do well on them, then later on I'll let you play some games. |
| 7 | 14 | Positive | Task | Some of these problems are really tricky. I like tricky problems because they make me think hard, but then I really feel good when I get them right. |
| 8 | 13 | Positive | Task | I never knew how important these skills were when I was your age, but I found out when I started writing checks and had to take care of my own money. |
| 9 | 7 | Negative | Consequences | Problems like these will be on the next test, so do them carefully. |
| 10 | 8 | Neutral | Task/consequences | You only have 20 minutes to finish, so work quickly. |
| 11 | 6 | Negative | Consequences | Work carefully--if you don't get at least 10 of them right, you'll have to do another page |
| 12 | 12 | Neutral | Task/Consequences | Let's see how many of you can get them all correct. |

NOTE: Statements 1-8 were used in balanced design for paired comparisons. Category code refers to codes that would be assigned to the statement using Brophy et al.'s 18 Category Coding System

Analysis of the students' responses indicate a great deal of paraphrasing of the stimuli (teacher statements) in response to open-ended questions ("What do you think when your teacher says . . ."). The interviewer had to probe extensively and steer the students' responses frequently in order to get meaningful information (student reactions/perceptions). The open-ended interview format was thus found to be unsuitable and inefficient for obtaining students' perceptions of and reactions to the 12 teacher statements. Consequently, the decision was made to pair two statements together and require a comparison, the students being asked to make a choice (preference) and then to provide a rationale for their preference. The paired comparison format was thought to provide enough structure to focus students' responses on their reactions/perceptions. Since all of the positive statements were paired with other positive statements, the possibility of the student making a choice merely because of social desirability was minimized. Similarly, a negative statement was paired either with the other negative statement or with a neutral statement, and one neutral statement was paired with a positive statement. Thus, contrasts between the two statements in each pair were kept at a minimum. Although minimizing the contrast between the two statements helped to reduce social desirability responding, there was a possibility that students might have a social desirability response set.

## The Paired Comparison Method

The theoretical rationale and the statistical procedures for the Law of Comparative Judgment, which is the basis for this method, were developed by Thurstone (1927a, b). The author will not review the development of this method nor provide its mathematical derivation. However, sources of such review are provided for the interested reader (Bock & Jones, 1968; Guilford,

1954; Thurstone, 1927a). Only the central concepts of the method are reviewed here.

According to Bock and Jones (1968), the method of paired comparisons requires that, "if n stimuli are compared, n(n-1)/2 of pairs of stimuli must be presented if all possible distinct pairs are to be judged." (p. 116) Thus, all stimuli

(S 's) are typically presented to an observer (O) in all possible pairs of non-identical (S 's). This results in n(n-1)/2 pairs and requires that the O pick one S in each pair over the other one in the pair. The O compares one to another and judges which is 'better' or 'preferred' or 'has more' of some defined quality or quantity.

To have a balanced design based on the paired comparison method, the number of distinct pairs that each O would have to judge would be 66, given the above mentioned formula. According to Bock and Jones (1968), "However easy the judgments may be, it is seldom feasible to require of a subject more than about 50 judgments in a multiple-judgment paired-comparison experiment. Even this number may not be attainable if the subject is poorly motivated. This means that the number of objects in a complete multiple judgment design cannot ordinarily exceed more than fifty" (p. 167). Bock and Jones's comments are particularly pertinent when the paired comparisons are used with young children. Given the characteristics of the sample in this study, the number of comparisons that a subject could reasonably judge would be far fewer than those recommended by Bock and Jones. When interviewing elementary school children, there is concern not only about the subjects' motivation, but also fatigue, satiation, and above all, the subjects' limited attention span (Yarrow, 1960). To address these concerns and achieve a balanced design, the following procedures were employed.

Since the main concern of this study was to gather information about students' reactions to positive statements made by teachers, a balanced design using eight positive statements (for a total of 28 comparisons) was employed. However, requiring the subject to make judgments on 28 multiple-judgment comparisons was not feasible, given the characteristics of the group under investigation. Thus, in order to conduct the study employing the method of paired comparisons, the author either had to further reduce the number of stimuli or use a fractional design. Reducing the number of stimuli would have considerably reduced the scope and the meaningfulness of the study, so the decision was made to employ a fractional design over the measures.

This design led each subject to be exposed to only half of all possible distinct combinations of the eight statements (14 comparisons). According to McKeon (1960), Bose (1956), and Kendall (1955) this design would still yield complete tables of proportion scores where the statements could be analyzed as a set. Three comparisons of interest were generated from the remaining four statements that were classified as neutral or negative. These three comparisons were not part of the balanced design, and therefore were subjected to separate statistical analyses.

Division of the Set of Comparisons. An 8X8 matrix consisting of all possible combinations of the eight statements was divided into two equal parts based on the criterion that no statement appears in one part more than four times. The numbers 1 through 8 (statement numbers) identifying the rows and columns of the matrix were reordered, using a table of random numbers. The combinations based on the reordered statement numbers made up the two parts of Form A of the interview. A second reordering of the statement numbers was done in the manner described above, and the author made sure that no systematic patterns appered in both the first and second reordering of the

numbers. Combinations based on the second reordering of the statement numbers made up the two parts of Form B of the interview. Table 3.7 presents the combinations that comprised the two parts of Forms A and B. The two different forms of the interview were created so that the subjects were not confounded with the form of the interview.

The order in which the statements were presented within each combination could also affect the subjects' choice. In order to control for order effects, half of the subjects received the appropriate half of the Form A or B where the order of the statements within each comparison was reversed. The allocation scheme for the two forms is shown in Table 3.8. The appropriate "half forms" were randomly assigned to subjects in each cell.

Open-Ended Questions. In Part II of the interview, the subjects were asked to explain the circumstances/conditions in which teachers make no introductions and launch directly into tasks. The results of the Brophy et al. (1983) study indicated that student engagement was generally higher when teachers moved directly into tasks than when they began with some presentation statement. This was quite contrary to the researchers' expectations, so the question was of considerable importance in this study.

The preceding part of the interview using the paired comparisons provided an adequate background for the students so that they were able to respond to the open-ended question without problems. The nature of the questions in the preceding part provided a smooth transition to this part of the interview. The students were told: "We have just talked about the many different ways teachers give assignments. But sometimes they might not use any of those different ways of giving assignments. They might just say: 'Do the problems on pages thirty-seven and thirty-nine' and not say anything else." Pilot testing had indicated that elementary school children were able to provide meaningful

Table 3.7. Combinations for Interview Forms (Part I)

| A1 | A2 | B1 | B2 |
|---|---|---|---|
| 3, 6 | *5, 12 | 1, 2 | 5, 7 |
| 8, 4 | 6, 2 | 8, 3 | 6, 8 |
| 2, 1 | 1, 8 | 5, 4 | 1, 3 |
| 3, 5 | 3, 4 | 7, 6 | 2, 5 |
| *9, 10 | *9, 10 | *9, 10 | *9, 10 |
| 7, 4 | 6, 7 | 2, 3 | 4, 7 |
| 1, 6 | 2, 5 | 4, 8 | 1, 6 |
| 5, 8 | 3, 8 | 5, 1 | 5, 8 |
| 2, 3 | 1, 4 | *11, 9 | *11, 9 |
| *11, 9 | *11, 9 | 3, 7 | 3, 4 |
| 7, 1 | 5, 7 | 2, 8 | 2, 6 |
| 5, 4 | 2, 8 | 5, 6 | 1, 7 |
| 6, 8 | 4, 6 | 1, 4 | *12, 8 |
| *12, 4 | 3, 7 | 8, 7 | 3, 5 |
| 1, 3 | 5, 1 | *12, 6 | 4, 6 |
| 7, 2 | 2, 4 | 4, 2 | 1, 8 |
| 6, 5 | 7, 8 | 3, 6 | 2, 7 |

* The pairs marked with an asterisk were not part of the set of pairs in the balanced design.

Table 3.8. Allocation of Forms for Part I of Interview

$C_1^{12}$

| | | | |
|---|---|---|---|
| $S_1A_1$ | $S_2A_2$ | $S_3B_1$ | $S_4B_2$ |
| $S_5RA_1$ | $S_6RA_2$ | $S_7RB_1$ | $S_8RB_2$ |

NOTE: $A_1$ and $A_2$ together make up the 28 paired comparisons for a balanced design using the first reordering of statement numbers

$B_1$ and $B_2$ together make up the 28 paired comparisons for a balanced design using the second reordering of statement numbers

$RA_1 \ldots RB_2$ are forms of A and B where the order of statements within each comparison is reversed

$RS_1 \ldots S_8$ represent the subjects in one cell

$C_1^{12}$ This allocation of forms is repeated for all of the 12 cells in the design

responses to this question when it was preceded by the paired comparisons. The subjects were told to generate a list of those circumstances/conditions in which the teacher gave no introductions.

In Part III of the interview, the students were asked to generate teacher statements that they would like to hear in order to make them "feel like really working hard in math." This question was included to find out the degree of overlap between the teacher statements presented in the paired comparisons and the statements generated by the students (see Appendix F).

## Validity of Instrument

Many measurement specialists believe that establishing the validity of a test is the most important problem facing test constructors (Ebel, 1977). Even though this issue is a critical one, there is no single satisfactory solution to the problem. Thus a variety of methods for reporting validity have been used in research.

Some measurement specialists favor the use of validity coefficients in terms of Pearson product-moment correlations: r (Mehrens & Lehman, 1978). However, Ebel (1977) warned that single quantitative indices of validity are not sufficient grounds for establishing the validity of a test. Instead, he suggested that a test should be "clearly defined" and focus upon the "reasonableness of inferences drawn from scores obtained in a particular situation." Since most parts of the instrument employed in this study were new, greater emphasis was placed on developing the instrument so that it met Ebel's criterion. The teacher statements reflected the coding categories defined by Brophy et al. (1983), and independent judges, when given the teacher statements, were able to code them in the correct categories. Further, these statements were based on those used most frequently by the teachers in the Brophy et al. (1983) study.

One major concern in that study was the ecological validity of the statements. This issue is of some importance, because where ecological validity is lacking, there is greater likelihood of the results indicating a developmental difference. (This issue has been discussed at length in the review of literature). The ecological validity of the statements was established by using the following procedures: a) six independent elementary school teachers were asked to provide feedback on the twelve teacher statements based on how frequently they were likely to be used by teachers at the elementary level and the appropriateness of the language/style of each statement. The feedback from the teachers was used to revise the statements. b) Teachers (N = 8) who participated in the study were asked to fill out a "Frequency of Use Survey" where, for each statement, they indicated on a five-point scale how frequently they would use the statements (see Appendix G).

## PROCEDURES

The student interviews were conducted by four graduate assistants who were part of the Classroom Strategy Research Project of IRT. There were two male and two female interviewers. Since the author was involved in the process of random assignment of students to various forms of the interview and was aware of the achievement level of students, she did not conduct any of the interviews. This was done in order to minimize interviewer bias. The interviewers were blind to the purposes of the study and the achievement information about the students. Each interviewer interviewed 24 students (two students randomly assigned from each cell of the design).

### Training of Interviewers

The interviewers were trained according to the principles outlined by Yarrow (1960), Baldwin (1960), Weinstein (1981) and other sources in child

development and social psychology. The training included the following elements:

1. Building a rapport with the students.
2. Considerations for interviewing in a school setting.
3. Considerations related to the developmental level of the student.
4. Reading statements with the right emphasis.
5. Identifying key motivation- related comments made by students and probing for more information on these comments.
6. Recognition of when a response is complete.
7. Recognition of when a response is unrelated to the question, and methods to refocus the student's response.
8. Alternative ways of stating open-ended questions to assure a full response from the student.
9. Alternative methods of probing.
10. How to handle pauses and "I don't know."
11. Methods to refocus wandering attention.
12. Methods of handling various types of "problem interviewees" (see Appendix H).

Interviewers were trained in four sessions of three hours each, and a variety of techniques was used. The general elements of the training were accomplished through a lecture format. After the interviewers had sufficient background about interviewing young children, role playing and critique were used to reinforce the issues addressed in the lecture. Further, the interviewers listened to audio-taped interviews conducted by an "expert" inteviewer. Written guidelines that focused the interviewer's attention on key elements of the "expert" interviewer's style were provided. Using the same guidelines, the interviewers also observed, through a one-way mirror, the "expert" interviewer

interviewing a student. The author felt that the interviewers' training should proceed gradually in order to ensure standardized interviewing procedures. Finally, each interviewer conducted three practice interviews before proceeding to the actual interviewing for the study. After every practice interview, the author provided extensive feedback so that each succeeding interview was of higher quality. A wrap-up session was held to address any issues or concerns raised in the process of training. An evaluation procedure (see Appendix I) was established which the interviewers completed after each interview. This evaluation form provided information about contextual factors that might have affected the interview and also indicated any concerns, observations, or questions the interviewers had after the interview.

Student Interviews

The student interviews were conducted at times suitable for teachers and students. Periods when there was testing, assembly, gym, and recess were avoided to minimize students' concern about "missing out on something."

The actual interviews took place in empty rooms within the school, far away from the classroom. This was done to reinforce the idea that the interview was "different" and confidential, and to allow more time for easing into the interview. On the way to the room, the interviewers attempted to establish rapport with the student, using first names to introduce themselves and conveying to the student that they were there to "learn from the student." The interviewer carried on an informal conversation, emphasized the confidential nature of the interview, and checked whether the student had "heard anything about the interview." Students were given the right to discontinue the interview if they wished. The seating arrangements in the interviewing room insured the comfort of the students who were seated away

from heat vents, drafts, distracting stimuli, etc., and who were seated close enough to the interviewers so that the voices could be audibly recorded on the tape. The actual interview began with the students testing out the tape recorder and playing it back to hear themselves on tape. This procedure was successful in reducing the students' anxiety (if any) about the taping process itself (see Appendix J).

The students were informed about the structure of the interview and what was required of them at each stage. The interviewers emphasized the unique nature of the task, and therefore the need to think very carefully about each question. They also made the students feel comfortable about repetitions of questions if they did not understand any part of them. The warm-up section of the interview focused the students' attention on math and the different things teachers might say while giving math assignments. This cued the students to the salient aspects of the interview (see Appendix J).

For the first part of the interview, each pair of statements was presented verbally, and the students could also follow them in a notebook that displayed the pair of statements in big, bold print (see Appendix K). This minimized the number of repetitions required and helped to focus the students' attention on the task. After the two statements were presented, the interviewer asked "Which of these two ways would you rather have your teacher give you the assignment?" Once the student made the choice, the interviewers asked, "Why would you rather have your teacher give you the assignment that way?" If the student's response or other nonverbal cues indicated that s/he had not understood the statements, they were repeated in reverse order. The open-ended questions were presented in a standard way to each student, and there were standard back-up questions that the interviewer could use if the student did not understand the original questions.

If a student wished to stop the interview, the interviewer reassured him/her that s/he was being helpful, that there were no right or wrong answers, and that it was a tough job to answer all the hard questions. However, the interviewers were told not to use peer comparisons ("Johnny got through it") in order to change the student's mind or offer rewards for continuing. One student's interview was not completed because the interviewer observed that she had severe speech problems.

After each part, students were told "You have two more parts to go," or "You only have one more question to answer." The entire interview ranged from 30-45 minutes and was conducted in a single session. On completion of the interview the students were thanked, assured that the interviewer had "really learned a lot," and
escorted back to the classrooms.

The overall time-line for implementing the study was three months. The school district was contacted in February, 1983, the Human Subjects Committee at Michigan State University in March. Data collection began in the first week of May 1983 and was completed before the end of the month.

## ANALYSIS

All of the student interview tapes (N = 96) were transcribed. The typescripts were then proofed by listening to the tape. This was done to insure that all student data were accurately recorded, all actual names deleted, and all pauses, sighs, etc. marked on the typescript. This proofing stage proved very valuable, because students often talked in hushed tones or mumbled. Many of their comments either were not heard or not understood on the dictaphone equipment, but were audible on the more powerful tape recorders used for interviewing. The preparation of typescripts took approximately five months.

Statement Preferences

As previously indicated, for this part of the interview each subject was a half replicate in the design. The preferences of the appropriate half-replicates were combined, and preference scores for 48 replicates were obtained. For the positive statements, each of which was presented to each replicate seven times, preference matrices were generated, using both raw preference scores and proportion scores (number of preferences divided by number of times statement was presented). The preference scores from the four statements which were not part of the balanced design were also converted into proportion scores. The proportion scores for each replicate were used to conduct a multivariate analysis of variance. Grade level, sex of the subjects, and achievement level of the subjects were the independent variables in the design and the proportion scores for each statement were the criterion variables.

In the analysis of variance in factorial designs, the total variation of the criterion variable is divided into orthogonal parts which are attributable to main effects, interactions and experimental error. One of the factors that influences the relative magnitude of each of the corresponding variances is the scale of measurement used in the study. As Winer (1971) points out, "In determining the choice of a scale of measurement for the observed data, two cases will be contrasted. In one case, a priori theory and experience determine the appropriate model as well as the appropriate scale. In the second case where there is neither adequate theory nor experience to serve as guides, the appropriate model and the proper scale of measurement are determined only after the experimental data have been partially analyzed. In the latter case, the design of the experiment should provide the experimenter with sufficient data to permit the evaluation of alternative formulations of the model." (p. 397). The present study could be an example of Winer's "second case."

Data transformation is one way to evaluate "alternative formulations of the model." Transformations, which are changes in the scale of measurement, are frequently used to achieve the following results: homogeneity of error variance (Box, 1953), normality of within-cell distribution, and additivity of effects (Tukey, 1949).

Two different transformations were used to convert the proportion scores. The first transformation was an arcsin transformation (which is: $X'_{ijk} = 2 \arcsin \sqrt{X_{ijk}}$ where $X_{ijk}$ is a proportion). second transformation was a logarithmic one, performed on the following converted score p/1-p, where p is the proportion. Since the results did not vary with the variation in the scale of measurement the reported results are based on the analysis performed on the original proportion scores.

## Teachers' Responses

Recall that teachers rated how frequently they used the 12 statements used in generating the paired comparisons. Teachers' responses to the statements were treated as scale variables and correlated with the student preference scores.

## Coding System for Qualitative Data

Students' reasons for preferences and responses to open-ended questions were coded by using a system designed by the author. This coding system was in part, empirically derived, based on the reading of a subset of actual interviews (two interviews were randomly selected from each cell of the design for a total of 24 interviews). The coding system incorporated recurring and distinctive themes that appeared in the interviews, and also variables derived from attribution theory, reinforcement theory, and the literature on

socialization.

The qualitative data pertaining to student preferences were coded for

1. Reasons for preference/non preference
2. Classification of multiple responses along various dimensions
3. First response classification
4. Level and kind of inference in students' responses
5. Themes that recurrently appeared within responses of each student (see Appendix L).

Students' responses to the open-ended questions were coded for

1. Reasons, conditions, situations in which the teacher gives no introduction
2. Kinds of motivational statements/activities that make students work hard.
3. Breakdown of the various motivational statements into specific subcategories (see Appendix M).

## Coding Procedures

Three graduate assistants working on the project coded the students' rationales for statement preferences and their responses to the open-ended questions. All data were at first coded independently by two coders after which they met to discuss the codes each of them had independently assigned and to resolve differences in codes through discussion.

The coders were blind to the specific hypotheses of the study. They were trained by the author (see Appendix N) on a subset of the transcripts and attained 80-percent exact agreement before actually coding all of the data. The percentage of exact agreement was computed by dividing the total number of agreements by itself, plus the number of disagreements, plus the number of

codes made by the first coder but not by the second, plus the codes made by the second coder but not by the first. This is a more conservative approach to assessing agreement than is commonly used to derive the percentage of exact agreement. The final reliability between coders was 82.5 percent.

Analysis of Students' Reasons for Statement Preference

Each specific category within the coding system (with the exception of the categories of first response classification and the number of interviewer repetitions and probes) was scored 0 (not used) or 1 (used). For each replicate these scores were aggregated according to the statement preferred. Thus, for each replicate there were 12 sets of rationale scores (one for each statement) and within each statement (Statements 1-8) any category coded 0 or 1 could have a score ranging from 0 to 7 (since each statement appeared seven times in the balanced design).

Frequency and breakdown data were obtained for these scores. The examination of descriptive statistics facilitated decisions about collapsing, summing up, or eliminating certain variables from further analysis. The data were aggregated across statements for each replicate because a statement-by-statement analysis of the rationales appeared to be too molecular to answer the questions posed in this study. The data on the reasons for non-preference were eliminated from further analysis because of the infrequency of their occurrence (see Table 3.9). The the specific categories (reasons for preference) were aggregated to form broad motivational categories. These broad motivational categories were useful in making results from this section comparable with students' responses to the open-ended question in Part III of the interview (What kinds of things could your teacher say/do to make you feel like working hard?) Table 3.10 presents the specific combinations of categories used to create the

Table 3.9. Frequency of Reasons for Non-Preference of Each Statement

| Variables | STATEMENTS 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0. None/not applicable | 200 | 148 | 123 | 176 | 119 | 133 | 190 | 111 | 98 | 14 | 32 | 62 | 1406 |
| 1. Don't like hard/tricky problems | 1 | 1 | 1 | 3 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 11 |
| 2. Has nothing to do with math/sounds silly/not enough information | 5 | 1 | 6 | 1 | 3 | 2 | 2 | 2 | 1 | 0 | 0 | 3 | 26 |
| 3. Consequences not important/unappealing | 3 | 2 | 3 | 0 | 4 | 1 | 2 | 0 | 8 | 0 | 0 | 1 | 24 |
| 4. Statement is pressuring | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 9 |
| 5. Fear of failure | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 6. Relevance in remote future | 5 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 7 |
| 7. Don't learn much from easy problems | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 8. Will be learning them again/later | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 9. Should learn instead of playing games | 5 | 3 | 3 | 4 | 3 | 0 | 4 | 2 | 0 | 0 | 0 | 1 | 25 |
| 10. Students might rush/ be careless/not get problems right | 1 | 2 | 3 | 1 | 1 | 1 | 0 | 0 | 26 | 0 | 1 | 1 | 37 |
| 11. Teacher doesn't mean it | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12. Teacher is bribing you/ trying to get you to work | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 |
| 13. Teacher shows no concern for accurate work | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| 14. Students don't like what teacher likes | 4 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| 15. Teacher not fair/mean | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 9 |

Table 3.9 (cont'd.)

| Variables | STATEMENTS 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16. Statement not grade appropriate | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 7 |
| 17. Other relevant/specify | 5 | 3 | 4 | 5 | 1 | 2 | 3 | 1 | 8 | 1 | 1 | 2 | 36 |
| 18. Other irrelevant/ specify | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 |

Table 3.10. General Motivational Categories in Reasons for Preference (Consisting of Specific Categories of Reasons for Preference).

| Motivational Categories | Category Combinations |
|---|---|
| Rewards | B6 + B17 + B18 + B23 + B25 |
| Challenge | B4 + B10 + B16 |
| Importance | B7 + B9 + B10 + B11 |
| Easy Work | B3 + B8 + B13 |
| Teacher Appeal | B21 + B22 |
| Intrinsic | B2 + B4 + B5 + B20 |
| Extrinsic | B17 + B19 + B23 + B24 + B25 |
| Task Related Information | B11 + B12 + B14 |
| Teacher Nice | B1 + B15 |
| Recognition | B23 + B24 + B25 |

*The B categories used in these combinations are the categories used to code students' reasons for preference (Appendix L)

broad motivational categories.

A multivariate analysis of variance procedure was used to analyze the scores aggregated over statements and the scores combined to create general categories.

The students' entire responses to Part I of the interview (statement preferences and rationales for preferences) were coded for general themes in students' responses. These categories of codes (Category K in the coding system) (see Appendix L) were considered dichotomous and scored as O (when category was not used) and 1 (when category was used). These scores were also used in the multivariate analysis of variance.

Students' Responses to Open-Ended Questions

Students' responses to the open-ended questions were also scored as 0 (not used and 1 (used) within each category of the coding system pertinent to that question with the exception of interviewer repetitions and probes. Frequency and breakdown data were obtained for each system. The variables generated from the coding system were also subjected to a multivariate analysis of variance.

When a category within the coding system was broken down into more specific categories (for example, rewards and punishments broken down into different kinds of rewards and punishment), the analysis of the specific categories was conducted on the subgroup of responses that were coded 1 (used) on the more general category. Thus, when performing analyses on the specific categories within rewards and punishments, only those subjects who had mentioned any rewards or punishments were included.

Statistical Versus Meaningful Significance

Statistical and meaningful significance are both important criteria to determine the success of a treatment/study. Statistical significance refers to the possibility of observed differences occurring due to chance. However, meaningful significance will be considered as a guide for interpretation of the results.

# CHAPTER FOUR

## RESULTS

This chapter on results consists of four sections. In the first section, students' preference data will be presented and compared with teachers' frequency of use data. The statements will be referred to by their number (as listed in Appendix E). The second section will focus on students' rationales for statement preferences and the general themes in their responses. In the third section, data from students' responses to the open-ended questions (Part II of the interview: When does the teacher launch directly into tasks within an introduction?) will be presented. In the fourth section, data from students' responses to the open-ended question: "What can your teacher say/do to make you feel like working hard?" are presented.

Within each section, general trends will be discussed first. These will be followed by a discussion of group differences in the data, focusing on the grade level, sex, and achievement level of the students. Results indicating a group difference (grade level, sex or achievement level main effects) will only be interpreted if there are no interactions associated with those variables. If interaction effects mediate any main effects appropriate qualifications will be mmade when presenting the data. The reported results of the analyses will be those that are significant at or below the .05 level of significance. Univariate tests for the dependent variables are reported to be significant only when the multivariate test associated with the set of dependent variables is significant. Thus, significance levels associated with the univariate tests are not due to chance.

## STATEMENT PREFERENCE DATA

### General Trends

Among the first eight statements (the set of positive statements), Statement 1 (You'll need these skills for math next year) was the one preferred by all groups of students an average of 68 percent of the time over all of the other statements in the set. Thus, among the eight choices offered in the set, students selected a direct statement about the importance of the material for insuring success in school achievement as the most powerful motivator, preferring it over statements of enthusiasm by the teachers, promises of rewards (the chance to play games or to have a good paper displayed on the bulletin board) and even teachers' attempts to point out that the skills being practiced would be needed for life outside of school.

Statements 4 and 7 were ranked second and third, and were preferred 58 percent and 57 percent of the time over all other statements in the set. Thus, statements communicating a promise of symbolic rewards for good performance and statements communicating the importance of learning and pride in mastering challenging material were frequently chosen by the students.

Statement 2 ranked fourth and was preferred 50 percent of the time over all other statements. Statement 3 was ranked fifth and was preferred 46 percent of the time. Statements 6 and 5 were ranked sixth and seventh and were preferred 42 percent and 41 percent of the time, respectively. Statement 8 was preferred only 38 percent of the time. These results are presented in Table 4.1.

Statement 9, which was paired with Statements 10 and 11, respectively, was overwhelmingly preferred over each of these two statements. Statement 9 was preferred 75 percent of the time over Statements 10 and 11. Statement 11

Table 4.1. Frequency of Statement Preferences

| Statement Numbers | Rank[1] | Statement Paired with | PERCENTAGE OF TIMES STATEMENT PREFERRED OVER OTHER STATEMENT IN THE SET | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total Group | Boys | Girls | Low Achievers | High Achievers | Second Grade | Fourth Grade | Sixth Grade |
| 1 | 1 | 2,3,4,5,6,7,8 | 68 | 65 | 71 | 66 | 70 | 63 | 68 | 73 |
| 2 | 4 | 1,3,4,5,6,7,8 | 50 | 53 | 47 | 50 | 50 | 58 | 48 | 44 |
| 3 | 5 | 1,2,4,5,6,7,8 | 46 | 44 | 48 | 41 | 50 | 46 | 40 | 52 |
| 4 | 2 | 1,2,3,5,6,7,8 | 58 | 58 | 58 | 62 | 54 | 64 | 64 | 46 |
| 5 | 7 | 1,2,3,4,6,7,8 | 41 | 42 | 39 | 41 | 41 | 33 | 41 | 49 |
| 6 | 6 | 1,2,3,4,5,7,8 | 42 | 43 | 41 | 47 | 37 | 52 | 53 | 21 |
| 7 | 3 | 1,2,3,4,5,6,8 | 57 | 56 | 58 | 59 | 55 | 58 | 47 | 66 |
| 8 | 8 | 1,2,3,4,5,6,7 | 38 | 38 | 38 | 35 | 41 | 28 | 38 | 48 |
| 9 | | 10, 11 | 75 | 74 | 76 | 76 | 74 | 77 | 69 | 79 |
| 10 | | 9 | 16 | 13 | 19 | 19 | 13 | 19 | 19 | 10 |
| 11 | | 9 | 34 | 39 | 29 | 29 | 39 | 28 | 43 | 31 |
| 12 | | 4,5,6,8 | 75 | 71 | 79 | 71 | 79 | 81 | 78 | 65 |

[1]Only Statements 1-8 were rank ordered since all possible distinct pairs of statements (1-8) were judged by each replicate

was preferred 34 percent of the time, and Statement 10 was preferred 16 percent of the time, over Statement 9. Statement 12, which was compared with Statements 4, 5, 6, and 8, was usually preferred to these four statements (75 percent of the time). The data indicate that Statement 9, which was classified as negative in the Brophy et al. (1983) study, was seen as positive by these students. Also, Statement 12 was classified as neutral in the Brophy et al. (1983) study, but was preferred by the students in this study to the four positive statements used in the comparisons. These unexpected findings are discussed in the next chapter.

Group Differences

Analysis of variance results indicate that grade level effects predominate in these data. The results of the analysis are presented in Table 4.2. Grade level effects were found for Statements 4, 6, and 8. Post-hoc pairwise comparisons indicated that second- and fourth-graders were more likely to prefer Statements 4 and 6 than sixth-graders. Statement 8 was more likely to be preferred by the sixth-graders than by the second-graders. Thus, the data suggest that second and fourth graders are more motivated by promise of rewards (symbolic or concrete) whereas the sixth graders are more motivated by statements that communicate the future utility of the material to be learned. Results of the post-hoc pairwise comparisons are presented in Table 4.3.

There were no sex differences and only one achievement level difference associated with these data. The lack of sex differences was not surprising, since the subject matter was controlled and the statements did not refer to sex-typed activities. However, frequent achievement level differences had been expected because the literature suggests that different environments exist for

Table 4.2. Analysis of Variance for Statement Preferences (Significance Levels)

| STATEMENT # | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 1 | .803 | .186 | .611 | .104 | .249 | .444 | .245 |
| 2 | .751 | .455 | .836 | .459 | .068 | .984 | .240 |
| 3 | .644 | .293 | .033* | .981 | .073 | .036* | .298 |
| 4 | .738 | .592 | .416 | .396 | .020* | .221 | .986 |
| 5 | .450 | .946 | .966 | .446 | .079 | .878 | .575 |
| 6 | .613 | .128 | .581 | .091 | .000* | .097 | .654 |
| 7 | .245 | .966 | .850 | .122 | .087 | .484 | .815 |
| 8 | .196 | .405 | .464 | .791 | .047* | .355 | .894 |
| 9 | .027* | .581 | .857 | .243 | .432 | .768 | .768 |
| 10 | .339 | .775 | .773 | .771 | .470 | .386 | .386 |
| 11 | .005* | .486 | .676 | .039* | .316 | .242 | .242 |
| 12 | .683 | .683 | .578 | .222 | .219 | .222 | .681 |

NOTE: The univariate F tests for each statement are considered significant only if the general multivariate test is significant.

* $p < .05$ level of significance

Table 4.3. Post-hoc Pairwise Comparisons of Significant Grade Level Effects (Statement Preference Data)

| Statement Numbers | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 1. Statement #4 | Value | .177 | -.002 | .179 |
| | Significance | .013* | .982 | .011* |
| 2. Statement #6 | Value | .316 | -.006 | .321 |
| | Significance | .000* | .930 | .000* |
| 3. Statement #8 | Value | -.188 | -.089 | -.098 |
| | Significance | .021* | .227 | .143 |

* $p < .05$ level of significance

NOTE: G1, G2, and G3 indicates 2nd, 4th, and 5th graders, respectively

high and low achieving students in the classroom, and that high achieving students like school better than low achieving students. The only achievement level difference in these data indicated that high achievers responded more favorably to the challenge of tricky problems (Statement 3) than low achievers.

Three way interactions were significant for Statements 9 and 11, indicating the presence of cell-specific effects. A two way, sex by grade interaction was significant for Statement 3. An examination of the cell means suggested that this interaction was disordinal. Second grade girls and fourth grade boys are less likely to prefer this statement than second grade boys, fourth grade girls and sixth graders in general.

## Results of Data Transformation

Recall that the preference data were transformed using the arcsin and logarithmic transformations. The main reason for using these transformations was to obtain additivity of effects. As Table 4.4 indicates, the transformations did not change the nature of the significant higher order interactions. The three-way interactions for Statements 9 and 11 have the same level of significance regardless of the scale of measurement. A logarithmic transformation would have eliminated the sex by grade interaction for Statement 3, but it would also have eliminated the achievement level main effect associated with that statement. An inspection of the significance levels obtained for each of the effects using the different scales of measurement suggests that the transformation did not affect the data systematically. The differences in results were statement-specific, so that the decision to use the proportion scores for the analysis seems justified.

Table 4.4. Analysis of Variance (Significance Levels) for Transformed Statement Preference Data[1]

| EFFECTS | TRANSFORM-ATIONS | STATEMENTS 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PROP. | .80 | .75 | .64 | .74 | .45 | .61 | .24 | .20 | .03 | .34 | .005 | .68 |
| SxGxA | ARC. | .83 | .78 | .60 | .84 | .51 | .68 | .34 | .28 | .03 | .34 | .005 | .95 |
| | LOG. | .81 | .80 | .47 | .86 | .69 | .80 | .76 | .70 | .03 | .34 | .005 | .95 |
| | PROP. | .18 | .46 | .29 | .59 | .94 | .12 | .97 | .41 | .58 | .78 | .49 | .68 |
| AxG | ARC. | .38 | .47 | .45 | .78 | .99 | .19 | .97 | .51 | .42 | .78 | .49 | .95 |
| | LOG. | .83 | .48 | .70 | .89 | .93 | .53 | .58 | .84 | .27 | .78 | .49 | .95 |
| | PROP. | .61 | .84 | .03 | .42 | .97 | .58 | .85 | .46 | .86 | .78 | .67 | .58 |
| SxG | ARC. | .80 | .83 | .04 | .38 | .94 | .59 | .89 | .74 | .81 | .78 | .67 | .49 |
| | LOG. | .91 | .83 | .11 | .32 | .87 | .70 | .97 | .77 | .73 | .78 | .68 | .50 |
| | PROP. | .10 | .46 | .98 | .40 | .45 | .09 | .12 | .79 | .24 | .77 | .04 | .22 |
| SxA | ARC. | .13 | .43 | .78 | .34 | .66 | .20 | .09 | .80 | .15 | .77 | .04 | .35 |
| | LOG. | .29 | .40 | .42 | .25 | .91 | .80 | .07 | .89 | .09 | .77 | .04 | .35 |
| | PROP. | .25 | .07 | .07 | .02 | .08 | .00005 | .09 | .05 | .43 | .47 | .32 | .22 |
| GR | ARC. | .16 | .06 | .08 | .02 | .07 | .00005 | .09 | .04 | .33 | .47 | .32 | .32 |
| | LOG. | .07 | .05 | .15 | .08 | .07 | .00004 | .13 | .05 | .24 | .47 | .32 | .32 |
| | PROP. | .44 | .98 | .04 | .22 | .87 | .09 | .48 | .36 | .77 | .39 | .24 | .22 |
| ACH. | ARC. | .44 | .99 | .04 | .19 | .79 | .13 | .44 | .44 | .53 | .39 | .24 | .35 |
| | LOG. | .49 | .97 | .09 | .17 | .69 | .34 | .45 | .70 | .30 | .39 | .24 | .35 |
| | PROP. | .25 | .24 | .30 | .99 | .58 | .65 | .82 | .89 | .77 | .39 | .24 | .68 |
| SEX | ARC. | .28 | .25 | .26 | .86 | .76 | .79 | .86 | .84 | .67 | .39 | .24 | .35 |
| | LOG. | .41 | .27 | .24 | .52 | .89 | .85 | .28 | .35 | .58 | .39 | .24 | .35 |

[1]Values associated with each effect reflect significance level of the effect.

## Teachers' Responses

Teachers rated (on a five-point scale) how frequently they used the statements that were presented to the students. In this section, results of the teachers' responses to the students are presented and compared with the students' preferences.

### General Trends

The statement most frequently used by the teachers was Statement 9. The average use of this statement was 3.90. They were also likely to use Statement 1 very frequently ($\bar{X}$=3.88), followed by Statement 5 ($\bar{X}$=3.15). Other, less frequently used statements were Statement 3 ($\bar{X}$=2.96), Statement 10 ($\bar{X}$=2.85), and Statement 8 $\bar{X}$=2.75). The teachers were least likely to use Statement 6 ($\bar{X}$=1.60) and Statement 11 ($\bar{X}$=1.23). These data are presented in Table 4.5.

### Relationship Between Teachers' Responses and Student Preferences

Correlations between teachers' responses and student preferences (see Table 4.5) for the statements showed significant relationships for three statements. Teachers' responses are positively related to students' preferences for Statements 1, 7, and 11. Recall that Statement 1 was the most frequently preferred statement by the students and Statement 11 was not frequently chosen over Statement 9 (which is very frequently used by the teacher). Thus, students' preferences were influenced to some degree by the extent to which they were exposed to the statement in the classroom. However, this influence does not seem consistent or systematic. The second ranked student preference was Statement 4. This statement was not frequently used by the teachers. Statement 5 is used quite frequently but is only preferred by a subset of the

Table 4.5. Comparisons Between Student Preferences and Teacher Frequency of Use.

| Statement No. | Student Preferences(Proportions) $\bar{X}$ | SD | Teacher Frequency of Use $\bar{X}$ | SD | Correlations Between Student Preferences and Teacher Frequency of Use. |
|---|---|---|---|---|---|
| 1 | .68 | .17 | 3.88 | .89* | .17 |
| | | | | | p = .047* |
| 2 | .50 | .17 | 2.21 | .87 | -.11 |
| | | | | | p = .15 |
| 3 | .46 | .16 | 2.96 | .94 | .16 |
| | | | | | p = .056 |
| 4 | .58 | .20 | 2.54 | .92 | -.15 |
| | | | | | p = .068 |
| 5 | .41 | .19 | 3.15 | 1.42* | .14 |
| | | | | | p = .08 |
| 6 | .43 | .25* | 1.60 | .79 | .05 |
| | | | | | p - .32 |
| 7 | .57 | .23* | 2.17 | 1.01 | .22 |
| | | | | | p = .02* |
| 8 | .38 | .21 | 2.75 | 1.65 | .05 |
| | | | | | p = .32 |
| 9 | .75 | .25* | 3.90 | .88* | .02 |
| | | | | | p = .43 |
| 10 | .16 | .23 | 2.85 | .58 | .01 |
| | | | | | p = .47 |
| 11 | .34 | .34* | 1.23 | .42 | .18 |
| | | | | | p = .04* |
| 12 | .75 | .32* | 2.29 | .61 | -.04 |
| | | | | | p = .35 |

* p < .05

students (upper grade students). Statement 7 is not used very frequently by the teachers but ranked third in students' preferences.

## REASONS FOR STATEMENT PREFERENCES

### General Trends

The most frequently mentioned reason for preferring a statement was that the skills to be learned would be useful in the future (need skills in the future). The second most frequently offered reason was belief in the importance of learning and doing hard problems. The third most frequent reason for preferring a statement was pride in good workmanship (feel good/proud about good work). Other reasons frequently offered by the students were: a concern for being rewarded or for avoiding negative consequences, appreciation of warning information provided by the statement, the possibility of peer recognition following good work, and the possibility that math would be easier in the future.

Some reasons were only mentioned when cued by the wording of thestatement, such as: I like enjoying problems (which was mentioned when Statement 2 was presented); I like to play games or it is good to get a break from work (which was mentioned when Statement 6 was presented), and it is fun to do another page (which was mentioned when Statement 11 was presented). These results are presented in Table 4.6 and 4.7.

Recall that the coding categories of reasons for preference were combined to form broad motivational categories. Results indicate that within these broad motivational categories students most frequently cited reasons pertaining to the importance of the academic task as their reason for preferring particular statements. Students frequently reported liking a statement because it conveyed that the task would be challenging. The prospect of reward for

Table 4.6. Frequency of Reasons for Preference of Each Statement

| Reasons for Preference | STATEMENTS 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0. None/not applicable | 7 | 3 | 7 | 6 | 1 | 3 | 5 | 5 | 23 | 0 | 0 | 1 | 61 |
| 1. Statement sounds better/teach-being nice | 4 | 14 | 12 | 4 | 7 | 14 | 7 | 4 | 4 | 0 | 0 | 9 | 79 |
| 2. Feel good/proud about good work | 4 | 5 | 3 | 53 | 2 | 9 | 81 | 1 | 1 | 2 | 3 | 10 | 174 |
| 3. Likes easy problems | 0 | 11 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 16 |
| 4. Likes hard/tricky/challenging problems | 0 | 3 | 12 | 3 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 1 | 71 |
| 5. Likes enjoying problems | 0 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 6. Likes to play games | 0 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 59 |
| 7. Need skills in real life | 111 | 2 | 2 | 1 | 114 | 1 | 8 | 72 | 11 | 1 | 1 | 2 | 326 |
| 8. Math easier in future | 58 | 1 | 4 | 1 | 11 | 1 | 9 | 9 | 13 | 0 | 1 | 1 | 111 |
| 9. Be a better student/get a better grade | 57 | 4 | 7 | 3 | 1 | 4 | 19 | 2 | 49 | 0 | 3 | 6 | 155 |
| 10. Important to learn/do hard problems. Can learn more/ think harder/be challenged | 43 | 13 | 62 | 4 | 18 | 4 | 95 | 16 | 9 | 1 | 7 | 13 | 285 |
| 11. Warning-information about task/time | 14 | 1 | 41 | 1 | 9 | 1 | 20 | 9 | 20 | 2 | 3 | 0 | 121 |
| 12. Student can pace him/herself/ has choice | 2 | 2 | 23 | 2 | 0 | 5 | 6 | 4 | 15 | 11 | 5 | 2 | 77 |
| 13. Problems might be easy | 0 | 41 | 37 | 0 | 1 | 2 | 2 | 0 | 4 | 2 | 0 | 2 | 91 |
| 14. Concern for accurate work on present task | 8 | 6 | 23 | 5 | 1 | 3 | 23 | 0 | 58 | 3 | 11 | 22 | 163 |
| 15. Teacher shows concern for studnet | 6 | 0 | 1 | 0 | 3 | 2 | 0 | 3 | 4 | 0 | 0 | 0 | 19 |
| 16. Teacher challenging/testing/ encouraging students to think hard | 1 | 1 | 10 | 3 | 2 | 0 | 17 | 1 | 8 | 2 | 1 | 12 | 58 |
| 17. Might be rewarded for good work/effort | 0 | 5 | 1 | 38 | 0 | 75 | 9 | 0 | 3 | 0 | 0 | 9 | 140 |

Table 4.6 (cont'd.)

STATEMENTS

| Reasons for Preference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18. Good to get a break from work | 1 | 1 | 2 | 0 | 0 | 23 | 2 | 0 | 0 | 0 | 0 | 1 | 30 |
| 19. Try harder to avoid negative consequences | 28 | 2 | 5 | 6 | 20 | 7 | 16 | 22 | 13 | 0 | 16 | 6 | 141 |
| 20. Fun to do another page | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 4 |
| 21. If teacher likes them, you will too | 0 | 58 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 63 |
| 22. Teacher personalizing is motivating | 0 | 12 | 0 | 0 | 0 | 0 | 3 | 29 | 1 | 0 | 0 | 0 | 45 |
| 23. Peer recognition/praise | 0 | 1 | 0 | 94 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 3 | 102 |
| 24. Incentive for other students | 1 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 25. Parents proud/can see good work | 0 | 4 | 1 | 27 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 4 | 42 |
| 26. Other relevant-specify | 20 | 38 | 40 | 46 | 4 | 14 | 41 | 6 | 15 | 1 | 6 | 29 | 260 |
| 27. Other irrelevant-specify | 0 | 1 | 2 | 0 | 3 | 0 | 2 | 6 | 1 | 0 | 0 | 0 | 15 |

Table 4.7. Frequency of Reasons for Preference Across Statements

| Reasons for Preference | FREQUENCY OF REASONS FOR STUDENTS' PREFERENCES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| 0. None/not applicable | 61 | 38 | 23 | 20 | 41 | 28 | 14 | 19 |
| 1. Statement sounds better/ teacher being nice | 79 | 48 | 31 | 38 | 41 | 41 | 21 | 17 |
| 2. Feel good/proud about good work | 174 | 81 | 93 | 84 | 90 | 71 | 44 | 59 |
| 3. Likes easy problems | 16 | 6 | 10 | 6 | 10 | 8 | 3 | 5 |
| 4. Likes hard/tricky/challenging problems | 71 | 45 | 26 | 30 | 41 | 32 | 16 | 23 |
| 5. Likes enjoying problems | 48 | 21 | 27 | 28 | 20 | 14 | 22 | 12 |
| 6. Likes to play games | 59 | 31 | 28 | 34 | 25 | 31 | 24 | 4 |
| 7. Need skills in the future | 326 | 166 | 160 | 153 | 173 | 98 | 95 | 133 |
| 8. Math easier in future | 111 | 44 | 67 | 59 | 52 | 29 | 46 | 36 |
| 9. Be a better student/get better grade | 155 | 80 | 75 | 71 | 84 | 32 | 63 | 60 |
| 10. Important to learn/do hard problems. Can learn more/think harder/ be challenged | 285 | 142 | 143 | 132 | 153 | 84 | 101 | 100 |
| 11. Warning-information about task/time | 121 | 82 | 39 | 37 | 84 | 22 | 25 | 74 |
| 12. Student can pace him/herself/has choice | 77 | 35 | 42 | 41 | 36 | 19 | 36 | 22 |

Table 4.7 (cont'd.)

| Reasons for Preference | FREQUENCY OF REASONS FOR STUDENTS' PREFERENCES | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| 13. Problems might be easy | 91 | 45 | 46 | 49 | 42 | 29 | 43 | 19 |
| 14. Concern for accurate work on present task | 163 | 70 | 93 | 75 | 88 | 48 | 50 | 65 |
| 15. Teacher shows concern for student | 19 | 9 | 10 | 11 | 8 | 7 | 0 | 12 |
| 16. Teacher challenging/testing/encouraging students to think hard | 58 | 26 | 32 | 21 | 37 | 11 | 23 | 24 |
| 17. Might be rewarded for good work/effort | 140 | 76 | 64 | 81 | 59 | 67 | 46 | 27 |
| 18. Good to get a break from work | 30 | 15 | 15 | 12 | 18 | 10 | 11 | 9 |
| 19. Try harder to avoid negative consequences | 141 | 61 | 80 | 77 | 64 | 18 | 68 | 55 |
| 20. Fun to do another page | 4 | 4 | 0 | 1 | 3 | 0 | 3 | 1 |
| 21. If teacher likes them, you will too | 63 | 22 | 41 | 28 | 35 | 25 | 16 | 22 |
| 22. Teacher personalizing is motivating | 45 | 27 | 18 | 16 | 29 | 12 | 12 | 21 |
| 23. Peer recognition/praise | 102 | 53 | 49 | 57 | 45 | 29 | 45 | 28 |
| 24. Incentive for other students | 9 | 3 | 6 | 5 | 4 | 3 | 1 | 5 |

Table 4.7 (cont'd.)

| Reasons for Preference | FREQUENCIES FOR EACH CATEGORY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| 25. Parents proud/can see good work | 42 | 27 | 15 | 31 | 11 | 14 | 19 | 9 |
| 26. Other relevant-specify | 260 | 126 | 134 | 141 | 119 | 91 | 92 | 77 |
| 27. Other irrelevant-specify | 15 | 6 | 9 | 14 | 1 | 6 | 8 | 1 |

NOTE: Since 17 pairs were presented to each student, the maximum number of times each category can be coded is 1,632.

good work also appealed to the students as did information related to the task at hand. Other reasons that appeared in the students' responses included the prospect of working on easy assignments, getting recognition (from peers, parents, teachers) or avoiding punishments. The two reasons that were relatively infrequent were both teacher related reasons (teacher appeal, teacher is nice). Finally, the categorization of the responses along the extrinsic/intrinsic motivational dimension suggested that a greater proportion of the students' reasons focused on extrinsic motivational concerns than on intrinsic motivational concerns (see Table 4.8).

The rationales presented by the students indicate that they did not discount or interpret negatively their teachers' positive introductions. In fact, only one student communicated mistrust of the teacher's motives or thought that the teacher was being manipulative. This student (a low achieving sixth grade boy) stated: "You feel like the teacher is just pressuring you and pressuring you and telling you that page 37 is easy but 39 is hard; so you feel like you want to just cry, that you have to do harder and harder work." Later, he stated: "He's acting like he's just your owner and can boss you around anywhere." Except for this one student, the students accepted the teachers' statements at face value.

Group Differences

The most predominant group differences were associated with grade level. The results of analysis of variance are presented in Table 4.9 and 4.10 and these results can be interpreted most meaningfully by dealing with the three grade levels separately. Post-hoc analysis of the significant grade level effects reveal the following patterns for the three grade levels (see Table 4.11 and 4.12).

The second graders' rationales were generally the most global and expressed in affective terms (like to enjoy problems, like to play games, like

Table 4.8. Frequency of Reasons for Preference (Broad Motivational Categories)

| REASONS FOR PREFERENCES | FREQUENCY OF RESPONSES IN EACH MOTIVATIONAL CATEGORY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| 1. Importance | 887 | 470 | 417 | 393 | 494 | 236 | 284 | 367 |
| 2. Challenge | 414 | 213 | 201 | 183 | 231 | 127 | 140 | 147 |
| 3. Rewards | 373 | 202 | 171 | 215 | 158 | 151 | 145 | 177 |
| 4. Task related information | 361 | 187 | 174 | 153 | 208 | 89 | 111 | 61 |
| 5. Easy work | 218 | 95 | 123 | 114 | 104 | 66 | 92 | 60 |
| 6. Recognition | 153 | 83 | 70 | 93 | 60 | 46 | 65 | 42 |
| 7. Punishments | 141 | 61 | 80 | 77 | 64 | 18 | 68 | 55 |
| 8. Teacher appeal | 108 | 49 | 59 | 44 | 64 | 37 | 28 | 43 |
| 9. Teacher nice | 98 | 57 | 41 | 49 | 49 | 48 | 21 | 29 |
| 10. Extrinsic | 434 | 220 | 214 | 251 | 183 | 131 | 179 | 124 |
| 11. Intrinsic | 297 | 151 | 146 | 143 | 154 | 117 | 85 | 95 |

NOTE: These motivational categories are derived by combining appropriate categories from the Reasons for Preferences

Table 4.9. Analysis of Variance for Reasons for Preference

(Significance Levels)

| REASONS FOR PREFERENCE | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 1. None/not applicable | .908 | .690 | .513 | .315 | .584 | .162 | .315 |
| 2. Statement sounds better/ teacher being nice | .547 | .689 | .337 | .336 | .060 | .710 | .210 |
| 3. Feel good/proud about work | .759 | .230 | .427 | .502 | .158 | .760 | .502 |
| 4. Likes easy problems | .093 | .937 | .937 | .999 | .302 | .314 | .314 |
| 5. Likes hard/tricky/challenging problems | .581 | .346 | .275 | .246 | .219 | .325 | .094 |
| 6. Likes enjoying problems | .324 | .197 | .455 | .766 | .167 | .239 | .375 |
| 7. Likes to play games | .681 | .420 | .681 | .815 | .002* | .352 | .640 |
| 8. Need skills in future | .423 | .781 | .408 | .004* | .048* | .224 | .738 |
| 9. Math easier in future | .045* | .065 | .677 | .438 | .239 | .546 | .053* |
| 10. Be a better student/get better grade | .011* | .657 | .311 | .160 | .025* | .380 | .735 |
| 11. Important to learn/do hard problems. Can learn more/think harder/be challenged | .560 | .309 | .474 | .398 | .670 | .395 | .903 |
| 12. Warning-information about task/time | .345 | .726 | .308 | .723 | .001* | .010* | .013* |
| 13. Student can pace him/herself/ has choice | .019* | .883 | .993 | .204 | .255 | .748 | .521 |
| 14. Problems might be easy | .807 | .673 | .884 | .144 | .046 | .543 | .931 |
| 15. Concern for accurate work on present task | .068 | .529 | .587 | .114 | .228 | .323 | .085 |
| 16. Teacher shows concern for student | .373 | .174 | .894 | .999 | .041* | .701 | .999 |
| 17. Teacher challenging/testing/ encouraging students to work hard | .595 | .835 | .849 | .519 | .219 | .172 | .519 |

Table 4.9 (cont'd.)

| REASONS FOR PREFERENCES | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 18. Might be rewarded for good work | .906 | .289 | .676 | .637 | .022 | .243 | .556 |
| 19. Good to get a break from work | .321 | .569 | .569. | .195 | .922 | .328 | .999 |
| 20. Try harder to avoid negative consequences | .513 | .948 | .614 | .462 | .008* | .462 | .295 |
| 21. Fun to do another page | .075 | .075 | .237 | .361 | .237 | .361 | .012* |
| 22. If teacher likes them, you will too | .096 | .478 | .820 | .391 | .389 | .391 | .024* |
| 23. Teacher personalizing is motivating | .792 | .270 | .792 | .318 | .584 | .253 | .378 |
| 24. Peer recognition/praise | .496 | .230 | .865 | .809 | .133 | .324 | .620 |
| 25. Incentive for other students | .128 | .286 | .388 | .014* | .388 | .777 | .399. |
| 26. Parents proud/can see good work | .154 | .573 | .915 | .032* | .318 | .018 | .216 |
| 27. Other relevant-specify | .236 | .297 | .980 | .410 | .598 | .219 | .672 |
| 28. Other irrelevant-specify | .624 | .252 | .286 | .615 | .094 | .003* | .303 |
| 29. Sum B | .235 | .970 | .174 | .218 | .412 | .685 | .927 |
| D. Response Classification | | | | | | | |
| 30. Can't rate | .886 | .611 | .584 | .235 | .451 | .116 | .235 |
| 31. Affective | .812 | .713 | .913 | .919 | .011* | .398 | .701 |
| 32. Relevance/logical appeal | .734 | .822 | .254 | .113 | .001* | .163 | .470 |
| 33. Task related information | .069 | .601 | .517 | .406 | .154 | .119 | .560 |
| 34. Reference to teacher motive/ goals/actions | .539 | .394 | .441 | .737 | .011* | .618 | .313 |
| 35. Rewards and punishment | .412 | .233 | .831 | .498 | .133 | .324 | .714 |

Table 4.9 (cont'd.)

| REASONS FOR PREFERENCES | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 36. Reaction to teacher | .458 | .668 | .157 | .953 | .262 | .382 | .953 |
| 37. Other relevant-specify | .230 | .881 | .881 | .050* | .038* | .067 | .592 |
| 38. Other irrelevant-specify | .631 | .294 | .260 | .798 | .099 | .007 | .414 |
| E. First Response | | | | | | | |
| 39. First response classification | .513 | .752 | .221 | .428 | .284 | .146 | .906 |
| F1. Student Makes Inferences From Statements | .356 | .056 | .640 | .834 | .001* | .056 | .408 |

* $p < .05$ level of significance

NOTE: The univariate F tests for each category are considered significant only if the general multivariate test is significant.

Table 4.10. Analysis of Variance (Significance Levels) for Reasons for Preference (Broad Motivational Categories)

| Variables | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 1. Rewards | .941 | .300 | .999 | .944 | .004* | .065 | .266 |
| 2. Punishments | .513 | .948 | .614 | .462 | .008* | .462 | .295 |
| 3. Challenge | .776 | .226 | .206 | .362 | .680 | .117 | .760 |
| 4. Importance | .136 | .374 | .195 | .026* | .001* | .012* | .188 |
| 5. Easy Work | .426 | .155 | .814 | .157 | .087 | .582 | .129 |
| 6. Teacher appeal | .196 | .364 | .804 | .867 | .400 | .139 | .406 |
| 7. Intrinsic | .870 | .325 | .378 | .326 | .286 | .680 | .805 |
| 8. Extrinsic | .566 | .610 | .632 | .707 | .107 | .058 | .885 |
| 9. Recognition | .378 | .480 | .999 | .520 | .090 | .023* | .287 |
| 10. Task related | .377 | .655 | .454 | .268 | .010* | .054* | .640 |
| 11. Teacher nice | .755 | .488 | .403 | .424 | .099 | .853 | .297 |

* $p < .05$ level of significance

NOTE: The univariate F tests for each category are considered significant only if the general multivariate test is significant.

Table 4.11. Post-hoc Pairwise Comparisons of Significant Grade Level Effects (Reasons for Preference Data)

| Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 1. Likes to play games | Value | 1.625 | .375 | 1.25 |
| | Significance | .000* | .451 | .002* |
| 2. Need skills in future | Value | -1.813 | .375 | -2.188 |
| | Significance | .043* | .711 | .043* |
| 3. Be a better student | Value | -1.75 | -1.938 | .188 |
| | Significance | .027* | .022* | .830 |
| 4. Warning-information about task/time | Value | -3.188 | -.188 | -3.0 |
| | Significance | .004* | .815 | .008* |
| 5. Teacher shows concern for student | Value | -.25 | .438 | -.688 |
| | Significance | .431 | .014* | .022* |
| 6. Might be rewarded for good work | Value | 2.5 | 1.25 | 1.25 |
| | Significance | .012* | .184 | .052* |
| 7. Try harder to avoid negative consequences | Value | -2.313 | -3.063 | .75 |
| | Significance | .001* | .005* | .491 |
| 8. Affective | Value | 5.563 | 4.188 | 1.375 |
| | Significance | .000* | .003* | .193 |
| 9. Relevance/logical appeal | Value | -5.688 | -3.375 | -2.313 |
| | Significance | .000* | .028* | .099 |

Table 4.11 (cont'd.)

| Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 10. Reference to teacher motive/goals/actions | Value | -4.125 | -.875 | -3.25 |
| | Significance | .009* | .384 | .035* |
| 11. Student makes inferences from statements | Value | 7.313 | 4.688 | 2.625 |
| | Significance | .000* | .020* | .045* |

*p < .05 level of significance

NOTE: G1, G2, G3 indicates 2nd, 4th, and 6th graders, respectively

Table 4.12. Post-hoc Pairwise Comparisons of Significant Grade Level Effects

(Reasons for Preference, Broad Motivational Categories)

| | Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|---|
| 1. | Rewards | Value | 4.5625 | .1875 | 4.375 |
| | | Significance | .009* | .903 | .000* |
| 2. | Punishments | Value | -2.313 | -3.063 | .75 |
| | | Significance | .001* | .005* | .491 |
| 3. | Importance of Task | Value | -7.75 | -2.686 | -5.063 |
| | | Signifance | .001* | .265 | .035* |
| 4. | Easy work | Value | .438 | -1.563 | 2.000 |
| | | Significance | .640 | .119 | .037* |
| 5. | Task related information | Value | -4.438 | -1.313 | -3.125 |
| | | Significance | .003* | .361 | .033* |

*p < .05 level of significance

NOTE: G1, G2, and G3 indicates 2nd, 4th, and 6th graders, respectively

tricky problems). They did not seem particularly concerned with issues related to relevance of the learning material or its practical utility in the future. Thus, the second graders' rationales expressed enthusiasm for the learning process (enjoying problems, liking hard problems), and pleasure in being rewarded (symbolically or concretely) for good work (feel proud about good work, will be rewarded for good work).

The fourth graders were more concerned than the second graders about issues related to the relevance of the learning materials and its practical utility. However, these students, like the second graders, were concerned about being rewarded for good work and liked playing games. The fourth graders were least likely to attribute positive motives to the teacher's actions (teacher shows concern for the student). They were also most likely to prefer statements that communicated that the task would be easy. In general, the fourth graders were concerned about the practical utility of learning, being rewarded for good work, and avoiding negative consequences associated with not learning the material. They also showed the strongest preference for easy work.

The sixth graders' reasons seem to focus more on the future use of skills, the importance of learning, an appreciation of warning information provided by thestatement, and avoiding perceived negative consequences. They were least likely to focus on reasons such as a liking for games or the possibility of being rewarded for good work. The sixth graders' responses were generally characterized by a concern with learning material that was useful and important to their future success in school and life, and their appreciation for the teachers' communicating this information.

Results indicate that high achievers respond more favorably to statements that communicate the importance of the academic task or provide warning

information about the task. The low achievers are more likely to prefer statements if they see a potential for recognition (either by peers or teachers or parents). These findings suggest that the high achievers focus on task related cues to make their judgments about the statements whereas the low achievers focus on the potential extrinsic rewards the statements might offer.

Sex effects were associated with four of the variables (reasons for preferences). One of the variables (math will be easier in the future) was also associated with a three-way interaction. The main effect cannot be meaningfully interpreted. Boys are more likely than girls to appreciate warning information about tasks provided by the statements and to dilute teachers' intended punitive effects associated with Statement 11 by indicating a liking for working on the extra page. Girls are more likely to identify with the teacher than boys (If teacher likes the problems, you will too). Most of the sex effects are associated with reasons for preference that are statement specific (fun to do another page or if the teacher likes it you will too). Only one reason (warning information about tasks) that showed a sex effect appeared frequently across statements.

Sex and achievement level did appear to have some cell specific effects. An examination of the cells means indicated that high achievers and boys were more likely to say that they preferred a particular statement because the skills to be learned would be useful in the future. Low achievers and boys are more likely to cite parental recognition as a reason for statement preferences whereas low achievers and girls are more likely to prefer statements if they have reason to believe that their performance might act as an incentive for other students. Although these are cell specific effects, there is some indication that low achievers (both boys and girls) base their statement preferences on extrinsic concerns (recognition, incentives for other students)

while high achievers (especially boys) are likely to be concerned with the potential utility of the academic task when judging the statements. Some reasons offered by the students were associated with higher order (three-way) interaction effects. Students reasons for preferring statements because of the possibility that math would be easier in the future or that the student could pace him/herself were associated with three-way interactions, suggesting that there were cell specific effects associated with these variables (reasons).

## General Themes in Students' Responses to Teacher Statements

In addition to coding students' preferences and rationales for their preferences, the students' responses were content analyzed to discover recurring themes in the responses. The entire set of responses to the statements were considered when coding the general themes in students' responses.

### General Trends

The most frequent theme in students' responses was a concern with future use of skills, mentioned by about 85 percent of the students. The second most frequent theme was the importance of learning and doing well, and pride in good workmanship (58 percent). Other themes that frequently appeared were theimportance of rewards (40 percent) and the importance of peer recognition and acceptance (24 percent). The students were also interested in challenging/hard problems (18 percent), concerned about parental recognition (12 percent), and wanted to get easy work and high success (12 percent). As mentioned previously, students did not perceive the teacher as manipulative or untrustworthy and the contrary perception was a recurring theme in only one student's response. These data are presented in Table 4.13.

Table 4.13. Frequency of General Themes in Students' Responses to Teacher Statements

| GENERAL THEMES IN STUDENTS' RESPONSES TO PAIRED STATEMENTS | FREQUENCIES FOR TOTAL SAMPLE | N= 96 | FREQUENCIES BY SEX | | FREQUENCIES BY ACHIEVEMENT LEVEL | | FREQUENCIES BY GRADE LEVEL | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Boys | Girls | Low | High | 2nd | 4th | 6th |
| 1. Concern with future use of skills | 82 | 85% | 39 | 43 | 40 | 42 | 21 | 30 | 31 |
| 2. Importance of learning/doing well/pride in good work | 56 | 58% | 29 | 27 | 27 | 29 | 16 | 15 | 25 |
| 3. Importance of rewards | 40 | 42% | 22 | 18 | 23 | 17 | 18 | 16 | 6 |
| 4. Importance of acceptance/ peer recognition | 24 | 25% | 10 | 14 | 12 | 12 | 6 | 11 | 7 |
| 5. Likes challenge/hard problems | 18 | 19% | 9 | 9 | 5 | 13 | 10 | 4 | 4 |
| 6. Importance of parental recognition | 12 | 13% | 8 | 4 | 9 | 3 | 4 | 7 | 1 |
| 7. Likes easy work/high success | 12 | 13% | 5 | 7 | 7 | 5 | 4 | 6 | 2 |
| 8. Dislikes math | 3 | 3% | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 9. Dislikes being pressured | 2 | 2% | 2 | 0 | 1 | 1 | 0 | 1 | 1 |
| 10. Teacher manipulative/untrustworthy | 1 | 1% | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 11. Likes to work/get more work | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NOTE: Since general themes were based on each student's entire response to the section on preferences, the maximum possible codes in each category is the same as the number of subjects (N=96).

Group Differences

The general themes in the students' responses to the statements parallel their preferences and the rationales for the preferences (see Table 4.14 and 4.15).

The second graders seemed most enthusiastic about rewards but showed little concern with the task's importance (relevance) and its future utility. The fourth graders were concerned with both rewards and the practical utility of the learning. The sixth graders' seemed mostly concerned about learning materials that have future utility but did not show any concern for being rewarded for good work.

There was a significant achievement level effect for the category "likes challenging/hard problems." The high achieving students were more likely to prefer challenges than low achieving students. There was a sex by achievement interaction for the category "importance of rewards." Examination of the cell means suggested that low achieving boys and girls and high achieving boys did not differ in their responses, but high achieving girls were least likely to mention the importance of rewards.

## WHEN DO TEACHERS GIVE NO INTRODUCTIONS?

General Trends

Data on students' responses to the open-ended question about instances when teachers launch directly into tasks without any introduction indicate that the most frequent reason was the assignment being a review task. This reason was mentioned by nearly half of the students in the study (49 percent). The next most frequent reasons were that the teacher was upset or the class was noisy and inattentive (45 percent), and that the teacher was busy or had to go somewhere (43 percent). Students also mentioned reasons such as that the

Table 4.14. Analysis of Variance for General Themes in Students' Responses to Teacher Statements (Significance Levels)

| Variables | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| General Themes | | | | | | | |
| 1. Importance of acceptance/peer recognition | .683 | .125 | .494 | .352 | .322 | .999 | .352 |
| 2. Importance of parental recognition | .121 | .735 | .902 | .058 | .068 | .058 | .203 |
| 3. Importance of learning/doing well/pride in good work | .307 | .200 | .569 | .999 | .021* | .675 | .675 |
| 4. Dislike of subject (math) | .269 | .269 | .269 | .565 | .999 | .565 | .565 |
| 5. Likes easy work/ high success | .693 | .235 | .693 | .228 | .393 | .528 | .546 |
| 6. Dislikes being pressured | .229 | .229 | .608 | .999 | .608 | .999 | .161 |
| 7. Importance of rewards | .075 | .091 | .814 | .026* | .003* | .177 | .367 |
| 8. Teacher manipulative/untrustworthy | .372 | .372 | .372 | .320 | .372 | .320 | .320 |
| 9. Concern with future skills | .765 | .914 | .914 | .996 | .001* | .551 | .234 |
| 10. Likes challenge/ hard problems | .074 | .743 | .413 | .105 | .074 | .032* | .999 |
| 11. Other-specify | .755 | .961 | .961 | .689 | .085 | .112 | .689 |

*p < .05 level of significance

NOTE: The univariate F tests for each category are considered significant only if the general multivariate test is significant.

Table 4.15. Post-hoc Pairwise Comparisons of Significant Grade Level Effects

(General Themes in Students' Responses to Teacher Statements)

| Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 1. Importance of learning/ doing well/pride in good work | Value | -.281 | .0313 | -.313 |
| | Significance | .019* | .806 | .009* |
| 2. Importance of rewards | Value | .375 | .063 | .313 |
| | Significance | .002* | .623 | .008* |
| 3. Concern with future skills | Value | -.313 | -.281 | -.031 |
| | Significance | .001* | .005* | .562 |

*p < .05 level of significance

NOTE: G1, G2, and G3 indicates 2nd, 4th, and 6th graders, respectively

assignment was a test (20 percent) a the teacher was testing or checking up on the students (19 percent). These results are presented in Table 4.16.

These responses suggest that students focus on two main kinds of cues when ascribing reasons for no introductions to assignments. Students generally tend to focus on either the nature of the assignment or behavioral cues emitted by the teacher. The reasons generated by the students seem to indicate that teachers give no introductions to tasks in rather unusual circumstances. There are no responses that indicate that teachers routinely launch into tasks without any kind of introduction.

Group Differences

The analysis of variance indicated that the only effects that were significant were grade level main effects associated with the variable A1 (It's a review), A2 (It's a test), and A5 (Teacher is upset/class is noisy or inattentive). These results are presented in Table 4.17 and 4.18. Correlations of these variables with grade level show a strong positive relationship indicating that there is an increase in frequency of these responses with an increase in the students' grade level. These results shed some light on one of the questions raised by the Brophy et al. (1983) study, where students were highly engaged in their tasks when teachers launched directly into tasks without any introduction. The reasons offered by the students that had significant grade level effects provide us with some clues about why students were highly engaged when no introductions were made by teachers. If the assignment is a review, it is likely that the teacher has previously communicated the characteristics of the task, its importance for the students, the consequences of not learning, and so on. Hence, the students could be highly engaged in the task. When the assignment is a test, the consequences of not being highly engaged in the task could be

Table 4.16. Frequency of Reasons for No Introductions

| Reasons for No Introduction | FREQUENCIES FOR EACH CATEGORY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| 1. It's a review | 47 (49%) | 23 | 24 | 23 | 24 | 7 | 16 | 24 |
| 2. Teacher upset/class noisy, inattentive | 43 (45%) | 24 | 19 | 20 | 23 | 6 | 15 | 22 |
| 3. Teacher busy/has to go somewhere | 41 (43%) | 22 | 19 | 23 | 18 | 11 | 17 | 13 |
| 4. It's a test | 19 (20%) | 7 | 12 | 7 | 12 | 4 | 2 | 13 |
| 5. Teacher testing students (checking up on students) | 18 (19%) | 9 | 9 | 7 | 11 | 5 | 4 | 9 |
| 6. Students busy/have to go somewhere | 10 (10%) | 5 | 5 | 3 | 7 | 4 | 3 | 3 |
| 7. Substitute is coming for the day | 6 (6%) | 3 | 3 | 3 | 3 | 2 | 1 | 3 |
| 8. Can't rate | 5 (5%) | 2 | 3 | 4 | 1 | 5 | 0 | 0 |

Table 4.17. Analysis of Variance (Significance Levels) for Reasons for No Introduction to Tasks

| Variables | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 1. It's a review | .259 | .481 | .321 | .763 | .001* | .973 | .733 |
| 2. It's a test | .864 | .044* | .746 | .093 | .001* | .246 | .154 |
| 3. Teacher testing students | .184 | .603 | .285 | .490 | .301 | .401 | .952 |
| 4. Teacher busy/has to go somewhere | .197 | .306 | .601 | .600 | .584 | .169 | .701 |
| 5. Teacher upset/class noisy/unattentive | .572 | .676 | .442 | .178 | .002* | .615 | .311 |
| 6. Students busy/have to go somewhere | .899 | .258 | .389 | .517 | .899 | .196 | .999 |
| 7. Sub is coming | .847 | .229 | .608 | .417 | .608 | .999 | .999 |

* $p < .05$ level of significance

NOTE: The univariate F tests for each category are considered significant only if the general multivariate test is significant.

Table 4.18. Pairwise Comparisons for Significant Grade Level Effects

| Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 1. It's a review | Value | -.481 | -.231 | -.250 |
| | Significance | .000* | .073 | .039* |
| 2. It's a test | Value | -.252 | .0913 | -.344 |
| | Significance | .031* | .284 | .001* |
| 3. Teacher upset/class noisy | Value | -.457 | -.238 | -.219 |
| | Significance | .000* | .058 | .079 |
| 4. Reduce work | Value | -.1771 | -.5414 | .3642 |
| | Significance | .202 | .001* | .016* |

*p < .05 level of significance

NOTE: G1, G2, and G3 indicates 2nd, 4th, and 6th graders, respectively

negative. Similarly, when the teacher is upset or the class is noisy, the impending consequences of off-task behavior could also be negative. The kinds of reasons offered by the students are conducive to producing on-task behavior. The increase in frequency of these reasons with an increase in grade level suggests that as students move to higher grades, they become more sensitive to contextual cues. (The Brophy et al. (1983) data were from grades 4-6).

These data were marked by an absence of sex and achievement level main effects. Achievement level effects were expected since previous research (Weinstein, 1981) has suggested that different environments exist for high and low achievers within a classroom.

## WHAT CAN TEACHERS SAY OR DO TO MAKE STUDENTS WORK HARD?

### General Trends

In response to the question about what teachers could say/do to make students feel like working hard, the most frequently mentioned response was that the teachers could offer rewards. About two-thirds of the students made reference to some kind of reward. About one-third of the students said that threats or punishments and statements communicating challenge would motivate them. Other responses, mentioned to a much lesser extent, included communicating the importance of the task, a personal appeal from the teacher urging the students to work hard, and getting easy work from the teacher. These were mentioned by an average of 15 percent of the students. These data are presented in Table 4.19.

### Group Differences

In these data grade level effects again predominated over sex or achievement level effects (see Table 4.20). The grade level effects can be

Table 4.19. Frequency of Responses to the Question: "What can teachers say or do to make students work hard?"

| What teachers could say or do to make student work hard? | FREQUENCIES FOR EACH CATEGORY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| Motivational Statements/ Activities | | | | | | | | |
| 1. Rewards | 58 (60%) | 30 | 28 | 29 | 29 | 14 | 19 | 25 |
| 2. Punishments | 31 (32%) | 18 | 13 | 16 | 15 | 10 | 14 | 7 |
| 3. It's challenging/hard | 29 (30%) | 15 | 14 | 14 | 15 | 12 | 8 | 9 |
| 5. It's important to learn | 16 (17%) | 6 | 10 | 8 | 8 | 2 | 1 | 13 |
| 6. Teacher personal appeal | 13 (14%) | 8 | 8 | 5 | 11 | 7 | 3 | 6 |
| 7. Give easy work | 13 (14%) | 8 | 5 | 7 | 6 | 0 | 8 | 5 |
| 8. Build self-concept | 11 (12%) | 8 | 3 | 9 | 2 | 3 | 0 | 8 |
| 9. It's enjoyable | 4 (4%) | 2 | 2 | 1 | 3 | 0 | 0 | 4 |
| 10. Math games/competitions | 2 (2%) | 0 | 4 | 1 | 3 | 1 | 2 | 1 |
| 11. None/can't rate | 2 (2%) | 0 | 2 | 2 | 0 | 1 | 1 | 0 |

Table 4.19 (cont'd.)

| | FREQUENCIES FOR EACH CATEGORY | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | For Total Sample N=96 | Boys | Girls | Low Achieving | High Achieving | 2nd Grade | 4th Grade | 6th Grade |
| **Kinds of Rewards** | | | | | | | | |
| 1. Special privileges | 44 (46%) | 24 | 20 | 24 | 20 | 10 | 17 | 17 |
| 2. Material rewards | 25 (26%) | 12 | 13 | 12 | 13 | 7 | 4 | 14 |
| 3. Reduce work | 23 (24%) | 11 | 12 | 11 | 12 | 2 | 13 | 8 |
| 4. Symbolic rewards | 21 (23%) | 11 | 10 | 8 | 13 | 8 | 7 | 6 |
| **Kinds of Punishments** | | | | | | | | |
| 1. Extra time/requirements | 16 (17%) | 9 | 7 | 7 | 9 | 3 | 10 | 3 |
| 2. Loss of privileges | 10 (10%) | 3 | 7 | 3 | 7 | 4 | 4 | 2 |
| 3. Symbolic punishment | 9 (9%) | 7 | 2 | 5 | 4 | 3 | 4 | 2 |
| 4. Long term negative consequences | 5 (5%) | 2 | 3 | 4 | 1 | 2 | 1 | 2 |
| **Reasons for Rewards/punishments** | | | | | | | | |
| 1. Completion | 38 (39%) | 20 | 18 | 19 | 19 | 10 | 15 | 13 |
| 2. Accuracy/quality of work | 36 (37%) | 16 | 20 | 18 | 18 | 8 | 13 | 15 |
| 3. Effort | 31 (32%) | 16 | 15 | 13 | 18 | 10 | 11 | 10 |

Table 4.20. Analysis of Variance (Significance Levels) for "What can teachers say or do to make students work hard?"

| Variables | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| Motivational Statements/ Activities | | | | | | | |
| 1. It's enjoyable | .358 | .367 | .999 | .303 | .018* | .303 | .982 |
| 2. It's challenging/ hard | .528 | .776 | .776 | .236 | .531 | .938 | .938 |
| 3. It's important to learn | .754 | .761 | .908 | .914 | .001* | .957 | .234 |
| 4. Rewards | .663 | .650 | .661 | .020* | .027* | .822 | .844 |
| 5. Punishment | .349 | .979 | .582 | .621 | .165 | .719 | .371 |
| 6. Math games/ competitions | .170 | .178 | .759 | .328 | .750 | .350 | .039 |
| 7. Time limits/ constraints | .510 | .465 | .402 | .934 | .769 | .941 | .025* |
| 8. Give easy work | .505 | .441 | .385 | .104 | .012* | .713 | .406 |
| 9. Teacher personal appeal | .280 | .843 | .202 | .639 | .387 | .126 | .957 |
| 10. Build self concept | .114 | .218 | .469 | .754 | .005* | .017* | .100 |
| Kinds of Rewards | | | | | | | |
| 1. Symbolic rewards | .502 | .117 | .763 | .837 | .198 | .216 | .793 |
| 2. Material rewards | .841 | .484 | .807 | .932 | .075 | .944 | .567 |
| 3. Special privileges | .429 | .571 | .213 | .063 | .251 | .304 | .534 |
| 4. Reduce work | .897 | .517 | .567 | .560 | .006* | .668 | .876 |
| Kinds Punishments | | | | | | | |
| 1. Loss of privileges | .251 | .706 | .666 | .391 | .930 | .157 | .059 |
| 2. Extra time/ requirements | .930 | .491 | .489 | .463 | .185 | .453 | .723 |

Table 4.20 (cont'd.)

| Variables | SxAxG | AxG | SxG | SxA | GRADE | ACHIEVEMENT | SEX |
|---|---|---|---|---|---|---|---|
| 3. Long term negative consequences | .250 | .479 | .136 | .907 | .484 | .156 | .350 |
| 4. Symbolic punishment | .390 | .499 | .012* | .796 | .963 | .875 | .141 |
| Reasons for Rewards/ Punishments | | | | | | | |
| 1. Completion | .245 | .582 | .067 | .249 | .828 | .892 | .973 |
| 2. Accuracy/quality of work | .739 | .556 | .576 | .060 | .547 | .832 | .154 |
| 3. Effort | .895 | .763 | .650 | .595 | .721 | .336 | .994 |

* $p < .05$ level of significance

NOTE: The univariate F tests for each category are considered significant only if the general multivariate test is significant.

interpreted most meaningfully by considering the three grade levels separately (Table 4.21 presents the post-hoc comparisons). Sixth graders were more likely than second or fourth graders to mention that teachers could present the task as enjoyable, or point out that it is important to learn the material, or offer rewards. The sixth graders also appreciated the teacher's communicating positive expectations and encouragement (building self concept) more than fourth graders.

The fourth graders' responses were characterized by a preference for easy or reduced work. They were more likely than the sixth or second graders to mention that they would be motivated to work hard if the teacher gave them easy work or offered reduced work as an incentive for doing well on the assignment.

These results generally parallel the results obtained from the preference data, except for the rewards category. In the preference data, sixth graders were least likely to choose games or having their papers displayed on the bulletin board. In response to the open-ended question, the sixth graders seemed most concerned about being rewarded for good work. Possible explanations for this apparent contradiction in results are discussed in the next chapter.

Few sex or achievement level effects were significant for these data. Girls were more likely than boys to say that they would work hard during math games or competitions. This finding was unexpected, since literature on this subject suggests that the relationship should be in the other direction (boys enjoy games and competitions more than girls). This result will be further discussed in the next chapter. The results also indicate that boys are more likely to work harder than girls when teachers impose time limits or constraints for completing assignments. The only achievement level effect that was

Table 4.21. Post-hoc Pairwise Comparisons for Significant Grade Level Effects

("What can teachers say or do to make students work hard?")

| Variables | | G1 - G3 | G1 - G2 | G2 - G3 |
|---|---|---|---|---|
| 1. It's enjoyable | Value | -.125 | 0 | -.125 |
| | Significance | .044* | | .044* |
| 2. It's important to learn | Value | -.342 | .032 | -.374 |
| | Significance | .000* | .710 | .000* |
| 3. Rewards | Value | -.330 | -.161 | -.168 |
| | Significance | .007* | .209 | .151 |
| 4. Gives easy work | Value | -.156 | -.258 | .102 |
| | Significance | .067 | .003* | .230 |
| 5. Build self concept | Value | -.153 | .097 | -.250 |
| | Significance | .111 | .083 | .003* |

* p < .05 level of significance

NOTE: G1, G2, and G3 indicate 2nd, 4th, and 6th graders, respectively

significant was for teachers' encouragement of students or communication of positive expectations (build self concept). Here, the low achievers were more likely to respond favorably to teacher encouragement than the high achievers. This finding is in keeping with what is known about high and low achievers (high achievers are more internally motivated and low achievers more externally motivated).

There were no higher order interactions present in the data. There was a significant sex by achievement interaction for offer of rewards. High achieving boys and low achieving girls are most likely to cite rewards as a motivator. The use of symbolic punishment (check marks on the board, sad face on the paper) showed a sex by grade interaction. Boys in second and fourth grades are more likely to be motivated by symbolic punishment than girls in those grades. However, in the sixth grade, girls are more motivated by symbolic punishment than boys.

## SUMMARY OF RESULTS

This chapter presented the results from the three general questions addressed by the study. In the first section results related to statement preferences were presented. It was demonstrated that grade level effects predominate in these data. Different scales of measurement were shown to affect the preference data unsystematically. The frequency with which teachers used the particular statements did influence the students' preferences for the statements to some degree. However, this influence did not seem consistent or systematic.

In the second section results related to students' reasons for preferences of statements were presented. It was established that students did not discount or negatively interpret the positive statements made by teachers. These results

also indicated that grade level differences in the kinds of reasons offered predominated over sex or achievement level differences.

In the third section data on students' responses to the open-ended question about instances when teachers launch directly into tasks without any introduction were presented. The results indicated that students' responses suggested that teachers give no introductions to tasks in rather unusual circumstances. Students' responses varied by grade level but not by sex or achievement level.

In the fourth section data on students' responses to open-ended questions about the kinds of things teachers could say/do to make students work hard were presented. In these data, too, grade level differences predominated over sex and achievement level differences. Results also indicated that there were some contradictory findings when these data were compared to the statement preference data. These contradictions and interpretation of the other findings are discussed in the next chapter.

# CHAPTER FIVE

# DISCUSSION

This chapter is divided into three sections discussing the limitations of the results, the nature of the results, and the implications of the study for future research and practice.

## Limitations of the Study

Several limitations of the data need to be mentioned before discussing the meaning of the results and their potential implications. First, the data were self report data, and thus open to social-desirability-responding and other forms of response bias that could detract from the validity of self report data. Although the students were interviewed individually and confidentiality was assured, the implicit demand characteristics of the interview situation (talking to an unknown adult, tape recording of the students' responses, etc.) may have caused some students to report only socially desirable responses. Social desirability was not a major concern because most of the statements used in the study were positive. Two negative statements (Statements 9 and 11) were used, however, although here the contrast in pairs was minimized by presenting these statements together or comparing one of them (Statement 9) to a neutral statement (Statement 10). There is reason to believe that Statement 6 (If you do well on them, then later on I'll let you play some games) may have evoked socially desirable responses, especially from the sixth graders. This issue will be discussed further in the next section.

A more serious threat to validity was posed by the content and structure of the questions. First, the students were asked to self-report their affective responses to statements teachers make about tasks in the process of introducing

these tasks. It is possible that many students do not have consistent affective responses to such teacher statements, or they may not be aware of and able to articulate the consistent affective reactions they might have. Thus, the students may have been giving their conception of what seemed like reasonable responses to the questions rather than actual accounts of their affective reactions.

Another limitation was that the content of the statements presented in pairs cued many of the students' responses to the questions. For example, students only mentioned enjoying problems following exposure to Statement 2 ("I like these kinds of problems and I think you'll enjoy them too."), and they only mentioned liking to play games following exposure to Statement 6 ("If you do well on them, then later on I'll let you play some games."). In general, many of the rationales and general themes in the students' responses to the first part of the interview were paraphrasings or minor elaborations of the content of the statement they had preferred.

The specific way in which each statement conveyed the motivational content could also have limited the kinds of responses that were given by the students. For example, Statement 8 stressed the utility of learning the skills with reference to the teacher's own experiences. The students' responses may have been different if instead of referring to the teachers' experiences, the statement had referred to the students' own experiences. The students' responses could also have been affected by the way in which the statement conveyed that the skills to be learned would be useful in real life. Statement 5 stressed that the skills to be learned would be useful in the future when students went grocery shopping or to the bank. The students' responses to this statement may have been different if the "real life" application of the skills were couched in terms of the students' present reality (e.g., You'll need these

skills when you go to buy some gum this evening).

With reference to the open-ended questions, it is possible that grade level effects were confounded with students' levels of verbal fluency. Some of the pairwise comparisons of significant grade level effects show decreases in frequency of the responses with decreases in grade level.

The nature of the sample in this study also limited the generalizability of the results. The selected students came from schools which served a homogenous working class population. The students' responses might have been different if they had been selected from schools serving poulations from other SES.

In summary, the paired comparison method was successful in enabling students (even most of the second graders) to understand and respond relevantly to questions about the effects of teachers' task presentation statements, although it appeared to induce or cue responses that might not have appeared if other methods had been used. The effects of different methods can be seen in the present data in the contrasts between the responses given in the paired comparison format and the responses given to the open-ended questions. The contrast is particularly salient in students' reactions to offers of reward, and is discussed in the next section.

## Discussion of Results

Recall that the primary purpose of the study was to develop information about how students perceive different teacher attempts to motivate them when introducing an academic activity. Further, the study was undertaken to develop post-facto explanations for why students in the Brophy et al. (1983) study did not respond positively (by being highly engaged in tasks) when teachers presented those tasks in a positive light.

One question was to assess the degree to which students discounted or negatively interpreted teachers' positive task introductions. Data on this point unequivocally indicate that students take teachers' statements at face value and do not question their motives. Only one of the 96 students interviewed attributed the teachers' statements to suspect motives (in this case, a desire to dominate and manipulate the student). Thus, the data provide no support for the hypothesis that the results of the Brophy et al. (1983) study were due to widespread tendencies to discount or negatively interpret their teachers' statements about academic tasks.

However, the data provide considerable support for the hypothesis that most of the "positive" task introductions observed in the Brophy et al. (1983) study were ineffectual or counterproductive because the "incentives" they offered did not actually function as incentives to the students. For example, in that study, teachers frequently used statements communicating positive expectations (that the task would be easy or enjoyable) to generate student motivation. In the present study, students rarely mentioned enjoying academic tasks, and when they did, they had been cued by the wording of one of the stimulus statements. Similarly, with the exception of fourth graders, informing students that the task would be easy did not boost motivation. In fact, students seemed more enthused when told that the task was important or chasllenging than when told that the task would be easy.

Other teacher motivation attemmpts commonly observed in the previous study included teachers' expressing personal enthusiasm for the task or relating the importance of the knowledge or skills being learned to successful coping with life outside of school. The present data show that students were not highly enthused by such teacher statements.

Thus, most of the "positive" teacher task presentations observed in the

earlier study were among the types that did not yield positive reactions by the students in the present study. Further, the task introduction statements that were received most positively by the students in this study (offering rewards for good performance or communicating the importance of the task for future school success) were rarely used by teachers in the earlier study. Thus, it appears that there is a poor match between the incentives stressed by the teachers and those incentives preferred by the students. This finding supports previous research findings of Ware (1978) and Yamamoto (1979). Ware concluded that there were differences between what students and teachers considered rewarding. Yamamoto concluded that there were differences between what children themselves considered stressful about their lives and what clinicians considered stressful about the children's lives. Clearly, students' perceptions of events that are relevant to their lives need to be given adequate consideration since these perceptions may be different from the perceptions of teachers or other adults.

The overwhelming preference for Statement 9 (negative statement) over Statement 10 (neutral statement) and Statement 11 (negative statement) suggests that the classifications for Statements 9 and 10 need to be re-evaluated. In the Brophy et al. (1983) study, statements mentioning that the material would be on a test were classified as negative, and reminders about time limits were classified as neutral. However, the present data suggest that students respond positively to statements that the material will be on the test, because such statements signal the importance of the material and alleviate some of the uncertainty associated with tests. In contrast, statements about time limits make students feel pressured and thus should be classified as negative, even though teachers intend these to be helpful reminders for the students.

One contradiction between the present findings and those from the previous study relates to Statement 12 ("Let's see how many of you can get them all correct."). The students interviewed in the present study preferred this statementover the four positive statements that it was paired with at consistently high rates (75 percent of the time). Further, a positive perception of challenge was frequently evidenced in the rationales offered by the students, and in the responses to the open-ended question about what teacher statements or actions would motivate them to work hard. However, in the previous study, student engagement rates were especially low when teachers introduced tasks by issuing challenges. It is possible that in the previous study, challenges were issued in contexts that were perceived as negative by the students. This is simply a speculation, however. The implied contradiction between the students' engagement rates following challenges in the previous study and their positive statements about challenges in the present study remains unexplained.

The second graders' reacted most favorably to teacher enthusiasm (Statement 2) and challenge (Statement 12). These preferences suggest a greater tendency among the second graders to identify with their teachers, as well as illustrating the operation of the "good boy" and "good girl" levels of moral development described by Kohlberg.

Students' responses to the question about occasions in which teachers launch directly into tasks without any introduction provided some explanation for the results of the previous Brophy et al. (1983) study, where students were highly engaged in tasks when teachers launched directly into tasks without any introduction. Students in this study frequently mentioned that teachers launched directly into tasks when the assignment was a review. If the assignment is a review, it is likely to signal the importance of the material to be learned. Further, the teacher must have previously communicated the

characteristics of the task and the consequences of not learning the material. Hence, the students would be highly engaged in the task. This is all the more true when the assignment is a test.

However, all of the responses generated by the students indicate that, in their view, teachers launch directly into tasks without any introductions only in fairly unusual circumstances. It is possible that the section of the interview that preceeded this question (paired comparisons) led the students to believe that introductions to tasks are normal and routine. Thus, the nature of the students' responses to this question may have been, in part, a function of where this question was placed in the interview.

The results of this study clearly indicate that students' perceptions do mediate teachers' effects. When the results of the present study are juxtaposed with the findings of the Brophy et al. (1983) study, there is clear indication that students are not passive agents in their own socialization. The lack of a systematic relationship between frequency of teachers' use of various statements and students' preferences for the statements also suggests that students do mediate teacher effects. The cognitive motivational theorists have underscored the importance of incorporating cognitive processes in the study of motivation. This study lends support to cognitive theorists' notions about motivation.

## Implications and Future Directions for Research

This study focuses on teachers' attempts to socialize students to become motivated to learn (be engaged in academic tasks), and on how teachers' attempts at socializing were perceived by the students. The study thus falls under the general rubric of effective methods of fostering students' "motivation to learn." Research directed toward discovering effective ways to foster

"motivation to learn" needs to incorporate within its theoretical framework issues raised by educational psychologists about the applicability of traditional theories of motivation in classroom settings. As Brophy (1983) points out, "Most of the literature on motivation has been developed from the study of free choice behavior in play situations, but school is a work situation in which students engage in compulsory activities that require primarily mental rather than physical effort. Under these circumstances, although the more overt aspects of task performance can be manipulated through reward and punishment, development of motivation to learn (not merely to meet minimal requirement) will require attention to the more qualitative and cognitive aspects of task engagement" (p. 214).

This study was an exploratory study to discover why teachers' positive attempts to foster students "motivation to learn" fail to have the intended effects (lead to high engagement in tasks). Its results indicate that students' perceptions of the teachers' task introduction statements (one way of fostering "motivation to learn") do mediate teacher effects. Since this study was exploratory in nature, further research in the area is needed to establish whether its findings are universal. Clearly, future research could tap more dimensions that might influence the students' perceptions.

Previous research has indicated that teachers' attempts to motivate students are often unsystematic and inconsistent (Brophy, 1983). In the Brophy et al. (1983) study , teachers attempted to generate positive task motivation only about one-fourth of the time when introducing tasks to their students, and they were inconsistent in the kinds of things they said about such tasks. Brophy (1981) also pointed out that teachers' use of praise to motivate students is unsystematic and inconsistent. It is possible that stronger and more consistent effects on student motivation could be obtained if teachers were trained to

routinely introduce tasks with information designed to interest students in the content or skills that task offers.[1] The results of the present study would be useful in determining effective ways of introducing tasks.

Further research should also be conducted to discover valid and reliable ways of obtaining self-report data from students. The results of this study have indicated that students' perceptions of teacher actions/words do mediate teacher effects. However, the method used to obtain self-report data from the students imposed some limitations on interpretation of the findings. Research designed to assess the relative effectiveness of different methods of obtaining self report data from students, especially from elementary school students, is needed to make significant progress in the study of student mediating processes.

In conclusion, research in the area of student motivation needs to focus on effective ways to foster student engagement ("motivation to learn"). Since effective methods of fostering student engagement are a function of both the teacher's actions and the students' perceptions of those actions, researchers should also focus on methods of obtaining reliable and valid self-report data from the students.

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[1]Jere Brophy is planning one such study which will be pilot tested in 1985.

# LIST OF REFERENCES

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Anderson, L. M. (1981). Student responses to classroom instruction. Research Series No. 109. East Lansing, Michigan: Institute for Research on Teaching, Michigan State University.

Anderson, L., Evertson, C., & Emmer, E. (1980). Dimension of classroom management derived from recent research. Journal of Curriculum Studies. 71, 733-750.

Appel, Y. H. (1977). Developmental differences in children's perception of maternal socialization behavior. Child Development, 48, 1689-1693.

Austin, V.D., Ruble, D. N. & Trabasso, T. (1977). Recall and order effects as factors in children's moral judgments. Child Development, 48, 470-474.

Baird, L. (1973). Teaching styles: An exploratory study of dimensions and effects. Journal of Educational Psychology, 64, 15-21.

Baldwin, A. L. (1960). The study of child behavior and development. In P. Mussen(Ed.). Handbook of research methods in child development. New York: John Wiley and Sons, Inc.

Berg-Cross, L. G. (1975). Intentionality, degree of damage, and moral judgment. Child Development, 46, 970-974.

Berliner, D. C. (1976). Impediments to the study of teacher effectiveness. Journal of Teacher Education, 27, 5-13.

Berndt, T. J. (1977). The effect of reciprocity norms on moral judgment and causal attribution. Child Development, 48, 1322-1330.

Bloom, B. S. (1976). Human characteristics and school learning. New York: McGraw-Hill Book Co.

Bock, R. D. , & Jones, L. V. (1968). The measurement and predictions of judgment and choice. San Francisco: Holden-Day.

Braun, C. (1976). Teacher expectations: Sociopsychological dynamics. Review of Educational Research, 46, 185-213.

Bose, R. C., (1956). Paired comparison designs for testing concordance between judges. Biometrika, 43, 113-121.

Box, G.E.P. (1953). Non-normality and tests on variances. Biometrika, 40, 318-335.

Brophy, J. E. (1979). Teacher behavior and its effects. Journal of Educational Psychology, 71, 733-750.

Brophy, J. (1980). Teachers' cognitive activities and overt behaviors. Occasional Paper No. 39. East Lansing, MI: Institute for Research on Teaching, Michigan State University.

Brophy, J. (1981). Teacher praise: A functional analysis. Review of Educational Research, 51, 5-32.

Brophy, J. (1983). Conceptualizing student motivation. Educational Psychologist.18, No. 3, 200-215.

Brophy, J. & Good, T. (1974). Teacher-student relationships: Causes and Consequences. New York: Holt, Rinehart, and Winston.

Brophy, J. E., Rohrkemper, M. M., Rashid, H. & Goldberger, M. (1983). Relationships between teachers' presentations of classroom tasks and students' engagement in those tasks. Journal of Educational Psychology. 75, 544-552.

Calveric, B.R. (1979). Conceptualizations of others: A developmental investigation. Paper presented at the biennial meeting of the Society for Research in Child Development, San Francisco, March.

Campbell, D.T. & Stanley, J.C. (1966). Experimental and quasi-experimental designs for research, Chicago, IL: Rand McNally and Co.

Clark, B. M. & Creswell, J.L. (1978). Participants and nonparticipants perception of teacher nonverbal behavior. Paper presented at the annual meeting of the American Educatdional Research Association, Toronto, March.

Clark, C.M., Gage, N.L., Marx, R. W., Peterson, P. L., Stayrook, N. G., & Winne, P.H. (1979). A factorial experiment of teacher structuring, soliciting, and reacting. Journal of Educational Psychology. 71, 534-552.

Cobb, J. A. (1972). Academic survival skills and elementary achievement. In E. Meyen,G. Vergason and R. Whelan (Eds.). Strategies for teaching exceptional children. Denver, Colorado: Love.

Cooper, H. & Good, T. (1984). Pygmalion grows up. New York: Academic Press.

Cox, D. R. (1958). Planning of experiments. New York: John Wiley and Sons, Inc.

Denham, C. & Lieberman, A. (Eds.). (1980). Time to learn. Washington, D.C.: National Institute of Education.

Dodge, K. A. (1980). Social cognition in children's aggressive behavior. Child Development, 51, 162-170.

Doyle, W. (1979). Classroom tasks and students' abilities. In P. Peterson and H. Walberg (Eds.). Research on teaching. Berkeley, California: McCutchen.

Dunkin, M.J. & Biddle, B.J. (1974). The study of teaching. New York: Holt, Rinehart, and Winston.

Dweck, C.S., Davidson, W., Nelson, S., & Enne, B. (1978). Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III: An experimental analysis. Developmental Psychology, 14,268-276.

Ebel, R. (1977). A proposed solution to the validity problem. Unpublished manuscript. East Lansing, Michigan. Michigan State University.

Eisenberg-Berg, N. (1979). Development of children's prosocial moral judgment. Developmental Psychology, 15, 128-137.

Emmer, E., Evertson, C., & Anderson, L. (1980). Effective classroom managementat the beginning of the school year. The Elementary School Journal, 80, 219-231.

Entwisle, D. R. & Hayduk, L. A. (1978). Too great expectations. Baltimore, MD: Johns Hopkins University Press.

Flavell, J. H., Botkin, P.T., Fry, C.L., Wright, J. W. & Jarvis, P. E. (1968). The development of role-taking and communication skills in children. New York: Wiley and Sons.

Gage, N. L. (1963). Handbook of Research on Teaching. American Educational Research Association, Chicago, IL: Rand McNally.

Good, T. L. (1979). Teacher effectiveness in the elementary school. Journal of Teacher Education, 30, 52-60.

Good, T. L. (1983). Classroom research: A decade of progress. Invited address at the annual meeting of the American Educational Research Association, Montreal, Canada, April.

Good, T. L. & Beckerman, T. M. (1978). Time on task: A naturalistic study in sixth-grade classrooms. Elementary School Journal, 78, 193-201.

Good, T. & Brophy, J. (1978). Looking in classrooms (second edition). New York:Harper and Row.

Good, T. & Brophy, J. (1980). Educational psychology: A realistic approach. New York: Holt, Rinehart, and Winston.

Good, T. & Dembo, M. (1973). Teacher expectations: Self-report data. School Review, 81, 247-253.

Guilford, J.P. (1954). Psychometric methods. New York: McGraw-Hill.

Harter, S. (1967). Mental age, IQ, and motivational factaors in the discriminationlearning set performance of normal and retarded children. Journal ofExperimental Child Psychology, 5, 123-141.

Harter, S. & Zigler, E. (1974). The assessment of effectance motivation in normal and retarded children. Developmental Psychology, 10, 169-180.

Hoge, R. D. & Luce, S. (1979). Predicting academic achievement from classroom behavior. Review of Educational Research, 49, 479-496.

Hops, M. & Cobb, J. H. (1974). Initial investigation into academic survival skills training, direct instruction, and first grade achievement. Journal of Educational Psychology, 66, 548-553.

Keasey, C. B. (1977). Young children's attributions of intentionality to themselves and others. Child Development, 48, 261-264.

Kendall, M. G. (1955). Further contributions to the theory of paired comparisons. Biometrics, 111, 43-62.

Kleinfeld, J. (1972). Instructional style and the intellectual performance of Indian and Eskimo students. Final Report, Project No. 1-J-027, Office of Education, U. S. Department of Health, Education, and Welfare.

Koopman, E. J. & Schroeder, N. (1977). Evaluation of a modified Bronfenbrennerquestionnaire assessing children's perceptions of teachers' behaviors. Perceptual Motor Skills, 45, 1247-1251.

Kounin, J. S. (1970). Discipline and group management in classrooms. New York, Holt, Rinehart and Winston.

Kounin, J. S. & Doyle, P. H. (1975). Degree of continuity of a lesson's signal system and the task involvement of children. Journal of Educational Psychology, 67, 159-164.

Kounin, J. S. & Gump, F. V. (1974). Signal systems of lessons settings and the task-related behavior of preschool children. Journal of Educational Psychology, 66, 554-562.

Kounin, J. S. & Sherman, L. W. (1979). School environments as behavioral settings. Theory into Practice, 18, 145-151.

Kun, A. (1978). Evidence for preschooler's understanding of causal direction in extended causal sequences. Child Development, 49, 218-222.

Kurdek, L.A. (1977). Structural components and intellectual correlates of cognitive perspective taking in first through fourth-grade children. Child Development, 48, 1503-1511.

Kurdek, L.A. (1978). Perspective taking as the cognitive basis of children's moral development: A review of the literature. Merrill-Palmer Quarterly, 24, 3-28.

Lenney, E. (1977). Women's self-confidence in achievement settings. Psychological Bulletin, 84, 1-13.

Livesley, W. J. & Bromley, D.B. (1973). Person perception in childhood and adolescence. London: Wiley and Sons.

Marshall, H. H., Weinstein, R. S., Middlestadt, S.E., & Brattesani, K.A. (1980). "Everyone is smart in our class": Relationships between classroom characteristics and perceived differential treatment. Paper presented at the annual meeting of the American Educational Research Association, Boston, April.

McKeon, J. J. (1960). Some cyclical incomplete paired comparison designs. Report No. 24. Chapel Hill. NC: University of North Carolina Psychometric Laboratory.

Mehrens, W. & Lehmann, I. (1978). Measurement and evaluation in education and psychology, second edition. New York: Holt, Rinehart, and Winston.

Meyer, W., Bachmann, M., Biermann, U., Hempelmann, M. Ploger, F., & Spiller, H.(1979). The informational value of evaluative behavior: Influences of praise and blame on perceptions of ability. Journal of Educational Psychology, 71, 259-268.

Mischel, W. & Mitzner, R. (1962). Preference for delayed reward as a function of age, intelligence and length of delay interval. Journal of Abnormal and Social Psychology, 64, 425-431.

Morine-Dershimer, G. & Fagel, F. (1980). Why do you ask? Paper presented at the annual meeting of the American Educational Research Association, Boston, April.

Morine-Dershimer, G. & Galluzzo, G. (1980). Pupil perceptions of teacher praise. Paper presented at the annual meeting of the American Educational Research Association, Boston, April.

Nisan, M. (1974). Exposure to rewards and the delay of gratification. Developmental Psychology, 10, 376-380.

Peterson, P.L. (1983). More than the eye can see: Students' thought processes during classroom instruction. Colloquium presented at the Institute for Research on Teaching, College of Education, Michigan State University, October 20th.

Peterson, P. L. & Swing, S.R. (1984). Students' cognitions as mediators of the effectiveness of small-group learning. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Rohrkemper, M. M. (1981). Classroom perspectives study: An investigation of differential student perceptions of classroom events. Unpublished doctoral dissertation. East Lansing, MI: Michigan State University.

Rohrkemper, M. (1984). The functions of inner speech in elementary school students' problem solving strategies. Paper presented at the annual meeting of the American Educational Research Association, New Orleans.

Rosenshine, B. (1970). Enthusiastic teaching: A research review. School Review, 78, 499-511.

Rosenshine, B. V. & Berliner, D. C. (1979). Academic engaged time. British Journal of Educational Psychology, 4, 3-16.

Rosenshine, B. & Furst, N. (1971). Research on teacher performance criteria: In B. Smith (Ed.). Research in teacher education: A symposium. Englewood Cliffs, NJ: Prentice-Hall.

Rosenthal, R. & Jacobson, L. (1968). Pygmalion in the classroom: Teacher expectations and pupils' intellectual development. New York: Holt, Rinehart, and Winston.

Rusnock, M. & Brandler, N. (1979). Time off-task: Implications for learning. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, April.

Samuels, S. J. & Turnure, J. E. (1974). Attention and reading achievement. Journal of Educational Psychology, 66, 29-32.

Sarafino, E. P. & Stinger, M. A. (1981). Journal of Genetic Psychology, 138, 291-299.

Sears, P. & Hilgard, E. (1964). The teacher's role in the motivation of the learner. In theories of learning and instruction. Sixty-third Yearbook of the NationalSociety for the Study of Education, Part I.

Sedlak, A.J. (1979). Developmental differences in understanding plans and evaluating actors. Child Development, 50, 536-560.

Shantz, C.U. (1975). The development of social cognition. In E.M. Hetherington (Ed.). Review of Child Development Research, Vol. 5, Chicago: University of Chicago Press.

Smith, M.C. (1978). Cognizing the behavior stream: The recognition of intentional action. Child Development, 49, 736-743.

Smyth, W. (1979). An ecological analysis of pupils' use of academic learning time. Unpublished doctoral dissertation, University of Alberta.

Stallings, J. A. & Kaskowitz, D. (1974). Follow through classroom observation evaluation, 1972-1973. Menlo Park, CA: Stanford Research Institute.

Stayrook, N.B., Corno,L., & Winne, P.H. (1978). Path analysis relating student perceptions of teacher behavior to student achievement. Journal of Teacher Education, 29, 51-56.

Stipek, D. J. & Tannatt, L. M. (1984). Children's judgments of their own and their peers' academic competence. Journal of Educational Psychology, 76, 1, 75-84.

Thurstone, L.L. (1927a). Psychological analysis. American Journal of Psychology, 38, 368-389.

Thurstone, L.L. (1927b). A law of comparative judgment. Psychological Review, 34, 273-286.

Tukey, J. W. (1949). One degree of freedom for non-additivity. Biometrics, 5, 232-242.

Van Treese, J.C. (1982). A psychological study of teachers' and school psychologists' perceptions of student reward preferences. Unpublished doctoral dissertation. East Lansing, MI: Michigan State University.

Walberg, M. J. (1976). The psychology of learning environments. In L. S. Shulman (Ed.). Review of research in education. (Vol. 4). Itasca, IL: Peacock.

Walls, R. T. (1973). Delay of reinforcement development. Child Development, 44, 689-692.

Ware, B. A. (1978). What rewards do students want? Phi Delta Kappan, Jan., 355-356.

Weinstein, R.S. (1981). Student perspectives on "Achievement" in varied classroom environments. In P. Blumenfeld (Chair). Student perspectives and the study of the classroom. Symposium presented at the annual meeting of the American Educational Research Association, Los Angeles.

Weinstein, R.S., Marshall, H. H., Brattesani, K.A., & Sharp, L. (1980). Achieving in school: Children's views of causes and consequences. A preliminary report on methodology. Paper presented at the annual meeting of the American Psychological Association, Montreal, September.

Weinstein, R. & Middlestadt, S. E. (1979). Student perceptions of teacher interactions with male high and low achievers. Journal of Educational Psychology,71, 421-431.

Weinstein, R. S., Middlestadt, S. E., Brattesani, K. A. & Marshall, H. H. (1980). Student perceptions of differential teacher treatment. Paper presented at the annual meeting of the American Educational Research Association, Boston.

Weisz, J. R. (1978). Choosing problem solving rewards and halloween prizes: Delay of gratification and preference for symbolic reward as a function of development, motivation and personal investment. Developmental Psychology, 14, 66-78.

Werner, H. (1948). Comparative psychology of mental development. New York: International Universities Press.

West, C.K. & Anderson, T. H. (1976). The question of preponderant causation in teacher expectancy research. Review of Educational Research, 46, 613-630.

Whiteman, M. (1967). Children's conceptions of psychologial causality. Child Development, 38, 143-155.

Winer, B. J. (1971). Statistical principles in experimental design. New York: McGraw-Hill.

Winne, P. (1977). Aptitude-treatment interactions in an experiment on teacher effectiveness. American Educational Research Journal, 14, 389-409.

Winne, P.H. & Marx, R.W. (1977). Reconceptualizing research on teaching. Journal of Educational Psychology. 69, 668-678.

Winne, P. & Marx, R. W. (1980). Teachers' and students' views of cognitive processes for learning from teaching. Burnaby, British Columbia: Instructional Psychology Research Group;, Simon Fraser University.

West, C. K. & Anderson, T. M. (1976). The question of preponderant causation in teacher expectancy research. Review of Educational Research, 46, 613-630.

Yamamoto, K. (1979). Children's ratings of the stressfulness of experiences. Developmental Psychology, 15, 581-582.

Yarrow, L. J. (1960). Interviewing children. In P. M. Mussen (Ed.). Handbook of Research Methods in Child Development. New York: Wiley and Sons.

# APPENDICES

# Appendices

A: Parental Permission Form

Dear Parent:

I am presently preparing to do my dissertation under the direction of Professor Jere Brophy at the College of Education at Michigan State University. In my study, I will look at what children think when teachers introduce new tasks or give assignments. I am particularly interested in children's reactions when tasks or assignments are presented in different ways by the teacher. For example, when giving an assignment, a teacher might say: "Do the problems on page 35. If you worked hard last week you should not have any problems today."

or

The teacher might say: "Do the problems on page 35 and let's see if we can all do well." I am mainly interested in finding out whether different kinds of statements have different effects on the children.

I would appreciate your consent to ask the children about their reactions to teacher statements similar to the examples given above. The children will be asked some questions to see if different kinds of introductions to assignments produce different reactions in children.

This would be the extent of the children's involvement. All responses will, of course, be kept confidential, and no names will be used in any research reports on these interviews.

Your consideration is greatly appreciated. If you have any questions or desire additional information, please feel free to call me at 353-9177 or 353-6470 between 8:00 A.M. and 5:00 P.M. Monday through Friday.

Sincerely,

Neelam Kher

Neelam Kher
Institute for Research on
Teaching

NK:js

PLEASE SEND THIS FORM BACK WITH YOUR CHILD TO HIS OR HER TEACHER

_____ I have read the above statement and agree to allow my child to participate.

_____ I prefer that my child not participate in the study.

_____ _____

PARENT SIGNATURE DATE

B. Information to Principals

This study is concerned with student perceptions to teacher task introduction. The study complements the Student Motivation Study directed by Dr. Jere Brophy from 1980 to present. In one part of the Student Motivation Study, observers recorded verbatim teacher expressions of belief, attitude or expectation about tasks made in an attempt to motivate or prepare students before beginning tasks. These observations were rated for the type of student expectation about the task that they were likely to engender (positive, negative, both, or neutral). During the task, the observers rated students' task engagement (clearly engaged, probably engaged, or clearly not engaged). The researchers had expected to find a direct relationship between positive task introductions and high student engagement. However, the results of data analysis were contrary to the researchers' expectations. Results indicate that negative task introductions did result in lower student engagement, but that positive task introductions had either no effect on student engagement or actually lowered student engagement in some cases.

All data from the Student Motivation Study have not yet been analyzed, so some of the puzzling findings may be explained when that process is completed. However, the Student Motivation Study did not include information on how students perceive teachers' task introductions. This present study attempts to gather information about students' reactions to these task introductions.

In the study, selected students from second, fourth, and sixth grades will be individually interviewed about their reactions to 12 teacher task introduction statements. They will also be asked to choose between pairs of task introductions and then explain reasons for their choice.

My main interest is in finding out: 1) do children at different grade levels perceive the statements differently? 2) Do children who are high or low achieving differ in their reactions to the statements? 3) Do boys and girls differ in their reactions to the statements?

The students' responses will be examined for general trends and unique patterns of perception among students.

Selection of the students from the grade levels of interest will be based on teachers' ranking of the students' achievement level. Students who fall at the extremes of the rank ordering will be interviewed, provided that their parents agree to their participation in the study. These students will be interviewed by me or other trained graduate assistants who work under the supervision of Dr. Jere Brophy. All interviewers will be unaware of students' rankings.

If you have any questions or need further information, please contact me.

Neelam Kher
Institute for Research on Teaching
218 Erickson Hall
Michigan State University
Phone: 353-9177 or 353-6470
Hours: 8:00 - 5:00, Monday through Friday

## C. Teacher Consent Form

I understand that this study by Neelam Kher, under the direction of Professor Jere Brophy from the Institute of Research on Teaching at Michigan State University, is an attempt to gather information about students' reactions to teacher task introduction statements. I understand that my involvement will be limited to rank-ordering the students on the basis of their achievement level in mathematics, their liking for mathematics, and how hard they try in mathematics, and helping to arrange for some of my students to be interviewed. I understand that the information I provide will be held in confidence and reported without mention of the names of participating teachers or students.

I also know that I am free to discontinue my participation in the study at any time, and that I will be given a report of the findings of the study when it becomes available.

_____
SIGNATURE

_____
DATE

## D. Ranking of Students

Dear

In this study I would like to learn about what children think and how they react when they hear teachers introduce new tasks or assignments in different ways. Students will be presented with various statements that teachers might make when introducing math tasks. They will then be asked how they would react to each of these statements.

In order to get a better understanding of students' reactions, I would like you to rank order your students' relative achievement in math, their feelings toward the subject matter, and how hard they try in math. Provided below is the information I need and the procedures to use in rank ordering.

1. Go through your class roster and rank order the children by their achievement level in mathematics, with #1 indicating the highest achiever. Use test data, performance on assignments, classroom observation, and whatever other information you may have, in order to make your best estimate of the students' relative achievement levels in mathematics.

2. Go through your class roster and rank order the students by how much they like mathematics, with #1 indicating the most liking for math. This rank ordering should be independent of your rank ordering by achievement level (i.e., some high math achievers may not especially like math, and some low math achievers may nevertheless enjoy it).

3. Go through your class roster and rank order the students by how hard they try in mathematics, with #1 indicating most effort in math. This rank ordering should be independent of your rank ordering of achievement level and liking for math (again, high effort does not necessarily go with high achievement or with liking for math).

Suggestions to Help in Rank Ordering

1. Identify the students who are at the top and at the bottom of the class. Then identify the student you think is in the middle. Then, fill in the rest of the ranks.

or

Group students in piles of high, middle, or low. Rank order each of the groups separately and then put them together.

(NOTE: These are some suggestions to make the rank ordering process easier. If you find another way of ranking more convenient, please feel free to use it.)

2. If you cannot differentiate between two or more children, assign those children the same rank number. For example, you may have the following sets of ranks: 1, 2, 3, 4, 5, 6, 7, 7, etc. Please minimize your use of multiple ranks, however.

3. Do each ranking without using information from the other ranking so that each ranking is independent of the others.

Thank you very much for your cooperation in this study. I will be in touch with you to set up interviews with your students at a time convenient for you.

Sincerely,

Neelam Kher

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Institute for Research
on Teaching
218 Erickson Hall
Michigan State University
East Lansing, MI 48824
(353-9177 or 353-6470)

NK:js

E. Teacher Statements Used in Paired Comparisons

1. It's important that you know these skills. You'll need them for math next year.
2. I like these kinds of problems and I think you will enjoy them too.
3. Page 37 should be no trouble at all but the ones on page 39 are harder. You'll have to think before you do them.
4. If you do a really good paper, I will put it up on the bulletin board.
5. It's important that you know these skills. You'll need them when you go grocery shopping or to the bank.
6. If you do a really good paper, then later on I'll let you play some games.
7. Some of these problems are really tricky. I like tricky problems because they make me think hard, but then I really feel good when I get them right.
8. I never knew how important these skills were when I was your age but I found out when I started writing checks and had to take care of my money.
9. Problems like these will be on your next test, so work carefully.
10. You have only 20 miutes to finish, so work quickly.
11. If you don't get at least ten of them right, you'll have to do another page.
12. Let's see how many of you can get them all correct.

## F. Open-Ended Interview Questions

Part II.

1. We have just talked about the many different ways teachers give assignments. But sometimes, they might not use any of those different ways of giving assignments. They might just say "Do the problems on pages thirty-seven and thirty-nine" and not say anything else. I want you to think for a minute and tell me when would your teacher say "Do the problems on pages thirty-seven and thirty-nine" and nothing more. Let's make a list of those times and I'll write them down.

Probe. When are the other times s/he might say "Do the problems on pages thirty-seven and thirty-nine." and not say anything else?

Probe. (If the student indicates that those are the only times their teacher says it) Think of all the other teachers you've had. When would they say "Do the problems on pages thirty-seven and thirty-nine" and nothing more?

Part III

1. We've talked about the different ways teachers could give math assignments. Sometimes when giving math assignments your teacher might say things that make you feel like working really hard. At other times, she might say things that make you feel like not working hard. What kinds of things could your teacher say when s/he's giving assignments that would make you feel like working really hard in math?

2. Of all the ways your teacher could give you a math assignment, what could s/he say to make you feel like working really hard in math?

3. What kinds of things could your teacher say when giving a math assignment that would make you feel like working really hard?

After each of these alternatives, state: Could you make a list of these for me and I'll write them down.

Probe: Why don't you think some more. I think you can think of some more.

Probe: Pretend you are in math class now. What could your teacher say before s/he gives you an assignment that would really make you want to dive in and work really hard?

Probe. (If student lists similar things, say: You told me about different (rewards, threats, etc.). Tell me some other things your teacher could say that would make you feel like working hard?

## G. Frequency of Use Survey

Instructions: Presented below are some statements teachers make while giving math assignments. For each statement given below, please indicate how frequently you would use it. The assignment in each of the statements presented below is pages 37 and 39 of the math book.

For each of the statements, use the following scale and circle the appropriate number on the scale.

1. Never use this statement.
2. Rarely use this statement.
3. Sometimes use this statement.
4. Frequently use this statement.
5. Very frequently use this statement.

1. Let's see how many of you can get them all correct.

1 2 3 4 5

2. It's important that you know these skills. You'll need them for math next year.

1 2 3 4 5

3. I like these kinds of problems, and I think you'll enjoy them too.

1 2 3 4 5

4. Problems like these will be on the next test, so do them carefully.

1 2 3 4 5

5. Do the problems on pages 37 and 39. Page 37 should be no trouble at all, but the ones on page 39 are harder, you'll have to think before you do them.

1 2 3 4 5

6. If you do a really good paper, I'll put it up on the bulletin board.

1 2 3 4 5

7. Work carefully--if you don't get at least 10 of them right, you'll have to do another page.

1 2 3 4 5

8. You only have 20 minutes to finish, so work quickly.

1 2 3 4 5

9. It's important that you know these skills. You'll need them when you go grocery shopping or to the bank.

1 2 3 4 5

10. If you do well on them, then later on, I'll let you play some games.

1 2 3 4 5

11. Some of these problems are really tricky. I like tricky problems, because they make me think hard, but then I really feel good when I get them right.

1 2 3 4 5

12. I never knew how important these skills were when I was your age, but I found out when I started writing checks and had to take care of my money.

1 2 3 4 5

## H. Training Sessions for Interviewers

### Session I:

### Context of the Interview

The interview is conducted in a very specified setting, i.e., the school setting. In order to conduct the interview, the students will have to be taken to a relatively quiet area away from their classrooms. In order to be able to interview, we need the cooperation of a number of people such as: the principal, the administrative staff at the school, the teachers, and the students who are to be interviewed (this is in addition to the cooperation of the parents who give permission to interview the children). The following guidelines are provided to minimize negative interactions with people whose cooperation is sought.

1. School etiquette.

   a. Inform principal of your arrival when you enter the school premises, also inform him/her of your departure.

   b. Make arrangements for the interview room in advance with the school secretary.

   c. Check the teacher's schedule so that students are interviewed at times most suitable for the teacher.

   d. Inform the teacher of the times you will be coming to interview and of any change in plans.

   e. Get the teacher's approval for the specific student to leave the classroom at a particular time.

2. Interactions with teachers.

   a. Be pleasant and friendly but maintain a professional stance.

b. Remember that the teachers' schedules and lesson plans take priority over the interviews. Make sure that the teacher's convenience is of utmost concern to you.

c. If you encounter situations where a teacher questions you about the nature of the study (over and above the information provided to the teachers) communicate to the teacher that the interviewers are blind to the purposes of the study so you do not have any information.

d. If a teacher gives you information about a student you are going to interview, communicate with the teacher (firmly but pleasantly) that you really should not hear that information for fear of biasing the interview.

e. If a teacher questions you about a specific student's response, communicate to the teacher that each student's response is completely confidential.

f. Teachers' schedules or plans could change unexpectedly, so be prepared to accept such changes in the interviewing schedule and take them in stride.

3. Interactions with the student

a. Remember that you are a stranger to the student and in order to obtain the student's cooperation you will need to build rapport with the student. This can be accomplished through an informal chat as you walk to the interviewing room or in the process of introducing yourself and the task to the students.

b. In your introduction, make sure you include the following points:

i. Your name and what you do (research at Michigan State).

ii. Goals of the interview (what kids think about things that go on in the classroom)

iii. Why the student's contribution is important (since you go to school all day, you know a lot about things that go on in the classroom)

iv. Confidentiality of the interview (what you say to me will be a secret. I won't tell your teacher or your parents or the other kids)

v. There are no right or wrong answers (we want to know what you think and feel about these questions. There are no right or wrong answers)

The interview introduction should be brief and delivered in a friendly and genuine manner.

c. Remain in control of the interviewing situation at all times. Do not let the student control the flow of the interview.

d. Once you start the process of the interview, remain on task and use the student's attention optimally.

Dress Code

1. Dress such that you have a low key appearance.

2. Certain outfits are intimidating (e.g., suits)

3. Certain accessories may be distracting (large earrings or flashy belt buckle, an unusual pendant)

## The Study

The following issues are discussed about the study.

1. The objectives of the study.

2. Development of the interview instrument.

## Discussion about the Interview Instrument

1. Demonstration of the delivery of each statement.

2. Point out which words in the sentence are to be stressed, appropriate speed of delivery for each statement, etc.

3. Practice session where each interviewer tries out the entire interview. Other members of the group provide feedback.

Assignment for the Day

1. Write out an introduction that you will use with the students. Keep in mind the salient points that need to be covered in the introduction.

2. Tape yourself delivering the introduction (bring the tape to next training session).

3. Review and familiarize yourself with the interview instrument.

Session II

1. Discussion of assignment given at the previous session.

2. Listen to the tape of each interviewer introducing him/herself. Provide feedback about the introduction.

3. Deal with any concerns about the interview instrument. Answer questions. Incorporate changes in the instrument (if necessary).

4. Role play situation: Each interviewer conducted the interview with one of the trainees role playing the student. Certain characteristics of students that might present a problem to the interviewers were highlighted by the person who role played the part of the "students" (fidgeting, not maintaining eye contact, being non-verbal, etc.).

After each role play situation, feedback is provided to the interviewer and there is a discussion of possible ways of dealing with the "problem student."

5. Important student cues

A. Silence/pause. Is the student thinking about the response or did s/he not understand the question? If the student is thinking, allow 10-15 second pause.

B. Repetition. When is it necessary to repeat the question to the student?

a) when student requests it

b) when student's answer bears no relation to the question

c) when silence is accompanied by a blank look/vacant stare.

6. Probing. When is it necessary to probe?

a) when student paraphases the choice made

b) when the student makes an inference based on the statement

c) when student mentions motivation components of teacher statement such as: it will be fun, easy, hard, tricky, positive affect, negative affect. d) when student generate list (Pt. II, III, V) say, "Why don't you think of some more."

7. Checking comprehension. Does the student understand the choice s/he made, e.g., if the student says: "I like the first one" check comprehension by asking "What does the teacher say in the first one?:

8. Moving to the next question. It is time to move on to the next question when:

a) probing has provided you with a full response

b) probing is ineffective: the student merely reiterates previous response

c) on being asked to produce more responses, the student says: "I can't think of any more."

NOTE: If the student being asked the question initially says: I can't

think of anything," the appropriate interviewer response would be, "Why don't you try to think." or "Take a guess.")

9. Things to avoid while interviewing. --using excessive verbiage will detract from the interview because the student will miss salient cues due to verbal overload. Use words that students can understand. Some "adult words" and correspondent "student words" are given below.

| Adult | Student/Child |
|---|---|
| preference | like |
| variation | something different |
| teacher statements | things teachers say |
| research | learn about/study |
| make-believe | pretend |
| explanation | tell me more about it |

Again, anything that will hamper students' understanding needs to be avoided (cognitive overload, adult word))

- deviating from the script. We would like any differences that emerge to be due to differences in students' responses and not interviewer differences.

- supplying the student with words to speed up the interview process or guide the student . This might bias the results.

10. Problem students and ways to deal with them

The student who looks away or does not maintain eye contact:

Say: I can't hear you too well if you talk with your face turned the other way or it's hard to get your voice on the tape if you look the other way.

The student who says "I don't know" to everything you ask:

Say: Why don't you take a guess, or why don't you think about it some more and then tell me, I know it's hard to answer these questions but why don't you think a little bit and tell me. . .

The student who is very verbal but does not answer the question:

Say: Yes, but why do you like this one or I'm not sure I understand why you like that one better. Constantly focus this student's attention to the question.

The student who is distracted or fidgety:

With the hyperactive kind of student, physical contact sometimes helps. If the student is fidgety, putting your hand on the student's knee may calm him/her down. With the distracted student, say: I need you to think very carefully about these questions because what you say is really important for this research.

The student who tries to figure out the "right" answer.

This student might look to you for approval after answering the question or say something like "Is that right?". Make sure you respond evenly to all responses. Make sure the non-verbal cues (nodding) do not seem conditional to the student. If the student asks you if the answer is right, say: There are really no right or wrong answers, we just want to know what you think.

Assignment for the Day

Interviewers are provided with a tape of an interview conducted by the trainer and a transcribed version of the taped interview. They are also given the transcript of another interview. The assignment involves: a) reading and evaluating the transcript based on the guidelines provided; b) listening and evaluating the taped interview according to the guidelines provided.

Guidelines for Assignment: Session II

Things to note when listening to tape

1. Keep copy of interview with you and follow along as you listen to the tape.

2. Note if the interviewer deviates from script.

3. Note if interviewer appears uncomfortable with silence (behavioral indicators: quick interjection when there is silence)

4. Note if interviewer cues a student's response.

5. Note if the interviewer is more enthusiastic about some student responses.

6. Note if interviewer is asking questions at a fast pace.

7. Note if student's response indicates lack of understanding.

8. Note whether comprehension checks are made systematically.

9. Note if student requests repetitions.

10. Note if question is not adequately probed.

11. Note general tone, delivery of interview and comfort level of interviewer.

Things to Note when Reading Transcripts

1. Note number of repetitions required.

2. Note adequately probed questions.

3. If question not probed adequately, write down what probes you might use to get a more adequate response.

4. Note words that the interview uses which might not be understood by the student.

5. Note if interviewer probes after the student has responded adequately.

6. Note good probes used by the interviewer.

7. Note good student responses.

Session III

1. Discussion of assignment given at the end of Session I. Appropriate way of dealing with the "mistakes" in the interviews (given for the assignemnt) are discussed.

2. Observe an "expert" interviewer interviewing a student.

One of the trainers interviewed a student and the interviewers observed the interview through a one-way mirror. Guidelines for observing the interviewer were provided and are listed below.

Guidelines for Observing Interviewer

a. Is the interviewer comfortable?

b. Is the student at ease?

c. Does the interviewer follow the script?

d. Does the interviewer respond evenly to all student responses?

e. What non-verbal cues does the interviewer emit?

f. Does the interviewer make systematic comprehension checks?

g. Does the interviewer probe systematically?

h. How does the interviewer deal with any problems presented by the student?

i. What non-verbal cues does the student give the interviewer?

j. Is the interviewer in control of the interview?

3. Discussion of the interview process using the guidelines provided to the interviewers (presented above).

4. Discussion of Murphy's Law and its application in field research. Each interviewer is provided with a list of things to check before interviewing. This is to minimize the applicability of Murphy's Law in this study.

## Checklist for Interviewers

Information each interviewer should have before interviewing:

1. Student to be interviewed by the interviewer.
2. I.D. associated with each student to be interviewed.
3. Interview form associated with each student.
4. The teacher to contact for each student to be interviewed.

### Prior to Interview, check the following:

1. Room is comfortable and quiet.
2. There is an electrical outlet.
3. Seating arrangement is such that both the interviewer's and the interviewee's voice is picked up on tape.
4. Seating arrangement such that it minimizes distractions (not facing window, door, etc.)
5. Proper interview form for student is available.
6. Recording sheets are in order
7. Recording sheets have student's I.D. number.

### After the Interview

1. Check tape recording
2. Rewind tape
3. Label tape with student's I.D. number (no names)
4. Label recording sheets and student rating scales (if not previously done)
5. At the end of each day, return used tapes and recording sheets, evaluations to June or Neelam.

## Things to Remember When Interviewing Students

1. Use words that students understand.

2. Use brevity in communicating. Excess verbiage will distract students from focusing on the task.

3. React evenly to all student responses (avoid words such as: That's good,

that's right, etc.).

4. Students have limited attention spans. Use their attention maximally.

5. Probe until you get an adequate response.

6. Avoid making judgments about the student's ability to answer all the questions during the process of the interview.

7. Allow for 15-20 second silence if student appears to be thinking about a response.

8. Make sure the student understands each statement. Check for comprehension (e.g., Which way was that).

9. Phrase any questions, probes, etc. such there are no yes or no answers. Thus, instead of saying, "Can you tell me more about it?" say, "Tell me more about it."

10. The tasks are not easy for the student. They may never have done this before.

## Probes for Part I of Student Interviews

1. Attention. Did student understand both statements/

Check: Do you want me to repeat the two statements?

2. Choice: Did student make a clear choice?

Probe 1: Which one do you like a little bit better?

Probe 2: If you had to hear just one of these, which one would you like?

3. Rationale: Does the student give an adequate reason for his/her choice?

ASK: Why do you like (student's preferred statement)

Probe 1: (if student paraphrases the preferred statement) You told me which one you like. I need to know why you like that one. OR I'd like you to tell me why you like that one.

Probe 2: Tell me more about it.

OR

Tell me that again.

Probe 3: (If student rambles and deviates from question), Yes, but I would like you to tell me why you like the one about (student's preferred statement)

REMEMBER

Attention

Choice

Rationale

End

Session IV

1. Discussion of interviewers experience with interviewing. Feedback on the interviews by the trainers.

2. Summary of all the relevant issues related to interviewing children.

3. Interviewers are provided with all materials necessary to conduct interviews.

4. Last minute questions or concerns addressed.

5. Review of appropriate conduct.

Assignment for the Day

Interview one student in the school setting so that interviewers have practice in environmental conditions similar to the actual interviews. Feedback provided to the interviewers individually by the trainers.

## I. Interview Evaluation

| | N/A | Negative | | Neutral | Positive | |
|---|---|---|---|---|---|---|
| 1. Principal/secretary contact | 0 | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 2. Teacher contact | | | | | | |
| Comments: | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. Room comfort | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 4. Student comfort | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 5. Interviewer comfort | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 6. Student's classroom environment | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 7. Introduction (general) | | 1 | 2 | 3 | 4 | 5 |
| Comments | | | | | | |
| 8. Part I | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 9. Part II | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 10. Part III | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |
| 11. Part IV | | 1 | 2 | 3 | 4 | 5 |
| Comments: | | | | | | |

| | N/A | Negative | | Neutral | Positive | |
|---|---|---|---|---|---|---|
| 12. Part V | | 1 | 2 | 3 | 4 | 5 |

Comments:

| | | | | | | |
|---|---|---|---|---|---|---|
| 13. Interviewer general affect | | 1 | 2 | 3 | 4 | 5 |

Comments:

14. Describe activity the class/student was engaged in when called out for interview. Note any unusual interactions, etc., in class.

15. General comments: (Anything noteworthy, unusual, that we should know about).

J. Introduction and Warm-Up for Interviews

General Introduction

I do research there. In our research we try to find out what goes on in schools and what makes teachers super. This way when people come to Michigan State to learn how to be teacher we can do a better job of training them. But maybe you never realized that teachers, your teacher, went to Michigan State. Do you know where that is? In East Lansing.

Did you realize that teachers were trained how to do their job by going to a college like Michigan State?

We consider you to be an expert that can tell us all about school. It's been a long time since we've been at school. And since you've lived almost your whole life by going to school, we think that you are the expert. And so we've interviewed a lot of children and most of them think it's kind of fun to answer our questions. I want you to know that there are no right or wrong answers to any of our questions. We are interested in knowing what you think when you hear these questions. And also that we won't be telling any one about what we talk about here. We won't tell your folks or we won't tell your classmates or even your teacher. So I want you to feel free to tell me exactly what you think. Exactly how you feel about our questions. And this will really help us with our research. Do you have any questions about what I've just said?

Before we start, I'd like to tell you what sometimes happens when I talk to kids. Sometimes I may not understand what you're saying. When that happens, I will repeat the question to you. Since you may never have thought of some of our questions, it's just fine if you don't understand them the first time. If at some time you're not sure of what I'm asking, please feel free to ask me to repeat the question.

Somtimes you may think we're asking you the same question twice. However, although some of the questions are similar, each one is a little bit different, so we want you to think carefully about each question.

O.K. Let's see if the tape recorder's picking up your voice and mine, so, I'm going to say "testing one, two, three," and then I want you to say "testing one, two, three." O.K. Testing one, two, three.

## Student Interviews

### Warm-Up

Let's pretend you're in math class and your teacher wants you to do page 35 of your math book. S/he might just say, "Do the problems on page 35. . ." or she might say something else, too. S/he might say, "Do the problems on page 35 and let's see if we can all do well. If we can, we'll move on to something different."

OR s/he might say,

"Do the problems on page 35. You'll be using the skills you learned last week. If you worked hard last week, you shouldn't have any trouble today."

### PART I

Introduction:

So we know that teachers have different ways of giving the same assignment. Let's pretend that your teacher wants you to do page 37 and 39 of your math book. I'd like you to listen to two statements at a time and tell me which one you think your teacher should say.

Let's see how many of you can get them all correct.

It's important that you know these skills. You will need them for math next year.

I like these kinds of problems, and I think you will enjoy them, too.

Problems like these will be on your next test, so do them carefully.

Page 37 should be no trouble at all, but the ones on Page 39 are harder, you will have to think before you do them.

If you do a really good paper, I will put it up on the bulletin board.

It's important that you know these skills. You will need them when you go grocery shopping or to the bank.

If you do well on them, then later on, I will let you play some games.

Work carefully- if you don't get at least ten of them right, you will have to do another page.

You only have 20 minutes to finish so work quickly.

I never knew how important these skills were when I was your age, but I found out when I started writing checks and had to take care of my money.



Some of these problems are really tricky. I like tricky problems, because they make me think hard, but then I really feel good when I get them right.

## L.Coding System for Statement Preferences

A. Preference

0. Not preferred.

1. Preferred because of negative qualities of the paired statement.

2. Preferred because of positive qualities of the preferred statement.

3. Both 1 and 2.

4. Student makes no choice.

B. Reasons for Preference

0. None/not applicable. The student does not offer a reason for the preferred selection.

1. Statement sounds better/teacher being nice. Code here when the student indicates that the statement sounds better. Example: "I just like the way it sounds," or when the student mentions that the teacher is being nice, "The teacher is being nice--she's saying it in a kind way."

2. Feel good/proud about good work. Coded in this section will be statements indicating that the student made the selection because of positive affect about high quality work. Example: "It makes me feel good inside when I see my paper on the bulletin board with a star on it."

3. Likes easy problems. Student statements referring to making the selection because. . . Example: "I like easy problems" or "It's fun to do easy problems." are coded here.

4. Likes hard/tricky/challenging problems. The student makes the selection because s/he prefers difficult, tricky, or challenging problems. Example: "I think tricky problems are fun to do." or "The harder the problems are, the more I like them."

5. Likes enjoying problems. Code here when the student indicates that he/she likes to do problems that are enjoyable. Example: "I like to do problems that I enjoy."

6. Likes playing games. Coded in this section are statements that inicate the student likes to play games. Example: "Playing games is fun," or "I like to play games."

7. Need skills for real life/future/school. This section will be coded when the student indicates that he/she made the preference because it had practical application for real life, future, or school. Example: "I will need to know this when I grow up." or "When I go to the next grade in school, I'll need these skills."

8. Math easier in future. Code here when the student's response indicates that the preferred statement conveys that math will be easier in the future. Example: "It is important because math won't be hard next year." or "Math will be a lot easier next year if you work hard now."

9. Be a better student/get a better grade. Code here when the student selection was based on the feeling that s/he would get a better grade or become a better student. Examples: "If I work carefully, I'll get a better grade on my test." or "Doing tricky problems will make me a better student." 10. Important to learn/do hard problems/can learn more/think harder/be challenged. The importance of difficult tasks, and learning, thinking hard, being challenged are coded here. Here the importance of this type task is distinguished from student affect which is coded in B4, and also is different from B1 and B8 because there is no indication that the student feels s/he will need these skills for the future or that math will be easier in the future.

11. Warning/information about task or time. Code here when the selection was made because the student feels the teacher is warning the students or giving them needed information about the task at hand or about time limits. Example: "She's telling us we only have 20 minutes to finish and I like that because it's kind of like a warning." or "I like her to tell me the problems are tricky because I'll know what to expect."

12. Student can pace him/herself/has choice. Here the reason for making the selection centers around the student feeling he has some control over the situation at hand. S/he can choose which page to do first or how to manage time.

Example: "I'd do the harder problems on page 39 first, and save the easier problems on page 37 for later." The student can pace him/herself, "I like to know there are 20 minutes left, because then I'll know how fast I'll have to work to finish on time."

13. Problems might be easy. Code here when the selection was made because the student infers that the problems on the present task will be easy. Example: "

14. Concern for accurate work. Here the student expresses the desire to be correct or get the problems right. Example: "I will get at least ten of the problems right, so I won't have to do another page."

15. Teacher shows concern for student. Coded here are statements indicating the teacher is showing concern for the students. Example: "When the teacher says that it means she cares about us--she wants us to know that when we grow up."

16. Teacher challenging/testing/encouraging students to think hard. Statements indicating the teacher motive for making the statement is that the teacher is testing and challenging or encouraging the students to

think hard are coded in this section. Example: "She said that because she wants us to feel like we're sort of in a contest to see if we can all do it well." or "She's testing us to see if we can really do them."

17. Might be rewarded for good work/effort. Coded here are statements that indicate the student feels s/he may be rewarded for good work or trying. Example: "She'll let me play games if I do a really good paper." or "If I work hard, she'll put my paper on the bulletin board."

18. Good to get a break from work. Here the emphasis is on getting a break from work rather than liking to play games (coded in B6). Example: "It's good to play games because we can use some time off from working all day long."

19. Try harder to avoid negative consequences. Here the student finds it motivating to try to avoid the negative consequences of the statement. Example: "I'd work hard so I wouldn't have to do another page." or "I'd really learn that stuff so I wouldn't mess up at the grocery store or get short changed at the bank."

20. Fun to do another page. Code here any reference that student preferred the statement because s/he would like to do another page. Example: "I wouldn't mind doing another page of math at all."

21. Teacher likes them, you will too. Students who indicate that they trust the teacher's opinion and that if the teacher says s/he likes the problems, the student believes s/he will enjoy the problems too.

22. Teacher personalizing is motivating. Code here when the student selection was based on finding the teacher's personal comments motivating. Example: "I like to know what the teacher did when s/he was my age."

23. Peer recognition/praise. Statements referring to making the selection because of what peers would say or think are coded here. Example: "If my paper was on the bulletin board, all my classmate would think I'm really smart."

24. Incentives for other students. Here students feel their good work would motivate other students to do good work also. Example: "If my friends saw my paper on the bulletin board, they'd want theirs up there too."

25. Parents proud/can see good work. Indication that the statement was selected because the student's parents would be pleased and may even see his/her work is coded in this category. Example: "My dad would be happy to see my paper up at conferences."

26. Other relevant-specify. Code here any response that does not fit into one of the categories above. These responses must seem relevant to make logical sense given the question. Specify.

27. Other irrelevant-specify. Statements that are irrelevant, and indicate that the student may not have understood the task or the statement are coded here. Specify.

C. Reasons for Non-Preference

0. None/not applicable.

1. Doesn't like hard/tricky problems. Code here when the student indicates he would not choose the statement because he does not like hard or tricky problems.

2. Has nothing to do with math/sounds silly/not enough information. Code here when the student does not prefer the statement because it is irrelevant, either s/he feels the statement has nothing to do with math,

the statement may sound silly to the student, or s/he may say that the statement does not contain enough information. Example: "This doesn't have anything to do with math." or "This one doesn't say very much."

3. Consequences not important/unappealing. Here the student reasons that s/he does not find the consequences of the statement important or appealing. Example: "I wouldn't pick this one because I don't want to do another page." or "It doesn't matter to me if I get my paper on the bulletin board."

4. Statement is pressuring. Code here if the student says s/he would not prefer the statement because it sounds pressuring or puts pressure on him/her. Example: "I feel under pressure when the teacher says page 39 is hard."

5. Fear of failure. Code here when the statement is rejected because the student feel s/he would not be successful at the task. Example: "I don't think I could get 10 of them right." or "I'm afraid I won't get the tricky ones."

6. Relevance in remote future. The statement was not selected because there is no immediate practical application. The statement has relevance only in the remote future. Example: "I won't have to write checks or go to the grocery store until I'm older."

7. Don't learn much from easy problems. Code here when the student rejects the statement because s/he has inferred that the problems will be easy and therefore, not much will be learned. Example: "If the teacher enjoys the problems, they'll be easy. You never learn from easy problems."

8. We'll be learning them again/later. Code here when the student does not prefer the statement because s/he thinks there will be other

opportunities to learn this skill. Example: "If we're going to have this in math next year, I can just learn it then." or "My older brother is learning that stuff now. I'll learn it when I'm in his grade."

9. Should learn instead of playing games. Here the student rejects the statement because s/he feels school is not for playing games, but for learning. Example: "It's more important to learn than to play games."

10. Students might rush/be careless/not do as well as possible. The statement is rejected because the student feels compelled to rush or be careless and not do as well as s/he is capable. Example: "When the teacher says that, it makes me feel like I have to hurry and I can't do my best when I hurry."

11. Teacher doesn't mean it. Code here when the student rejects the statement because s/he is skeptical of the teacher's credibility. The student does not believe the teacher. Example: "The teacher is just saying that. I don't believe her/him."

12. Teacher is bribing you/trying to get you to work. Code here when the student dismisses the statement because s/he feels the teacher's motive is to get students to work. The student feels the teacher is bribing him/her. Example: The teacher is just saying that to get you to work."

13. Teacher shows no concern for accurate work. The student rejects the statement because s/he feels the teacher is not showing concern for accurate work. Example: "When she says that, she just wants it done fast, she doesn't care if we get them right."

14. Students don't like what teacher likes. Code here when the statement is rejected because the student feels s/he likes different things from what the teacher likes. Example: "Just because the teacher likes it doesn't mean I'm going to like it."

15. Teacher not fair/mean. The statement is rejected because the student does not feel the teacher is being fair or that the teacher is not being nice. Example: "He's being mean or unfair when he says that."

16. Statement not grade appropriate. Code here when the student feels the statement would be more appropriate for a grade higher or lower than his/her grade. Example: "A teacher would say that if she were talking to first or second graders, not fourth graders."

17. Other relevant-specify.

18. Other irrelevant-specify.

D. Response Classification

Classify the student's reason for preference/non-preference in general terms using the following categories. Code as many as apply.

0. Can't rate.

1. Affective. The student likes/dislikes the statement because it sounds better/silly, makes him/her feel good/bad, excited/bored.

2. Relevance/logical appeal. The student likes/dislikes the statement because of the information it conveys regarding the importance of learning math, its utilities in the future, etc.

3. Task difficulty information. The student likes/dislikes the statement because the statement provides information about the task, e.g., "I like/dislike this statement because the assignment will be easy/hard, challenging, etc.

4. Reference to teacher motives/goals/actions. The student's response indicates that s/he is making inferences about the teacher's motives/goals from the statement. Example: "I like this one because I know the teacher will grade it easy."

5. Rewards and punishments. The student's statement indicates that s/he is focusing on the potential rewards or punishments that the statement conveys. Note: Code here if the student's response focuses on the reward/punishment, not merely because the statement itself refers to a reward or punishment.

6. Reaction to the teacher. The student's response indicates that s/he dislikes the statement as a reaction to his/her teacher, not the statement per se.

7. Other-specify.

E. First Response Classifications

If the student's response is multiply classified in D, what was the student's first response?

0. Not applicable/can't rate.

1. Affective

2. Relevance/logical appeal

3. Task difficulty information

4. Reference to teacher motives/goals/actions

5. Rewards and punishments

6. Reaction to teacher

7. Other. Specify

F. Does the Student Make Inferences?

Does the student's response indicate that s/he is making inferences about task difficulty/relevance/teacher concern, etc. (e.g., if the teacher says this, it must be because the assignment is hard.)

1. No.

2. Yes.

G. Interviewer Repetitions

How many times does the interviewer repeat the question before the student makes an initial response? (Code actual number here.)

H. Interviewer Probes

How many times does the interviewer probe to get a complete response? Count the number of probes after the student's initial response.

NOTE: For the following two codes (I and J), consider all the instances in which each statement appears.

I. Congruency of Response

Does the student contradict him/herself when a statement is repeated in the same presentation (e.g., when teacher allows students to play games, it's a bribe (non-preferred); later student says: I like it when the teacher lets us play games because it's relaxing)?

0. No/can't rate.

1. Yes.

| Statement No. 1 | Statement No. 5 | Statement No. 9 |
|---|---|---|
| 2 | 6 | 10 |
| 3 | 7 | 11 |
| 4 | 8 | 12 |

J. Statement confusing/subject to many interpretations

For each statement, rate on a 3-point scale the degree of confusion in the student as indicated by his response to multiple presentations of the statement. Indications of confusion in the student include: response that bears no relation to the statement, unique interpretation of the

statement, response that indicates a clear misunderstanding of the statement, etc.

| 1 | 2 | 3 |
|---|---|---|
| Very Confused | Somewhat Confused | Very Clear |

| Statement No. 1 | Statement No. 5 | Statement No. 9 |
|---|---|---|
| 2 | 6 | 10 |
| 3 | 7 | 11 |
| 4 | 8 | 12 |

K. General Themes

0. None/can't rate.

1. Importance of acceptance/peer acceptance. Code here when a prevailing theme of student's responses is being accepted by peers. Indications that s/he would make selections because peer could see his/her work, or peers would be impressed or like him/her better if he did well are coded here.

2. Importance of parental recognition. Code here if there is a general trend toward making choices because parents would be proud of them or parents might praise or reward them for good work.

3. Importance of learning/doing well/pride in good work. Here the student's theme is more personal and internally derived. The students express a personal pride in doing well, or stress the importance of learning.

4. Dislike math. This section is coded when it becomes evident that the student's selections were based on a dislike for math. The student may frequently mention "Math isn't really my favorite subject, so I'll pick this one."

5. Likes easy work/high success. When a student frequently suggests that s/he likes easy work or that high success is a priority, this section is coded.

6. Dislikes being pressured. Students frequently mention that pressure from teachers make them uncomfortable or that they are unable to do their best under pressure will be coded here.

7. Importance of rewards. Code here when the student frequently mentions rewards in his/her response.

8. Teacher manipulative/untrustworthy. When it is repeatedly mentioned by the student that the teacher cannot be trusted, or that the teacher has motives that are suspect, code this section.

9. Concern with future skills. When the general theme of the responses is that the student will need the skills for the future or that s/he is concerned about the future and how s/he will perform, this section is coded.

10. Likes challenge/hard problems. When the student makes selections because s/he enjoys a challenge or difficult problems, this section is coded.

11 Likes to work/get more work. Code here when selections are based on the student's desire for more work or because s/he enjoys the work.

12. Other. Specify.

## M. Coding System for Part II

Part II

When would the teacher just say do the problems on page 37 and 39 and not say anything else?

A. Reasons

1. It's a review. Students have worked on similar problems before, they know how to do it or its been explained before and may not need any further explanations.

2. It's a test. Since it is a test, the teacher is not allowed to help anyone, therefore, the teacher gives the problems without explanation.

3. Testing students. Teacher is trying to see if students can handle the problems without any explanations.

4. Teacher is busy/needs to go somewhere. The teacher has other things to do or has to leave the classroom for some reason (e.g., grading papers, taking care of student, see the principal, etc.) so s/he just gives the assignment.

5. Teacher is upset/class noisy/inattentive. The teacher may be in a bad mood either due to events in the class (e.g., class noisy/inattentive) or some unrelated reasons.

6. Other. Specify

7. Can't rate. No information.

B. Interviewer Repetitions.

How many times does the interviewer repeat the question before the student makes an initial response? (Code actual number here)

C. Interviewer Probes

How many times does the interviewer probe to get a complete response? Count the number of probes after student's initial response.

## Coding System for Part III

What kinds of things could your teacher say that would make you feel like working hard in math?

### D. Offer Rewards

The student indicates that s/he feels like working hard in math when the teacher offers a reward for completion/good work. Code the types of rewards mentioned by the student.

0. None. No rewards mentioned.

1. Symbolic rewards. Gold stars, name on the board, hanging good work on the bulletin board.

2. Material rewards. Food, drink, money, toys, prizes and other treats.

3. Special privileges. Free time, opportunity to be in leadership roles, choice of activities, opportunity to use desired equipment.

4. Reduce work. Time off from math, fewer problems, etc.

5. Other. Specify.

### E. Punishments/Threats

The student indicates that s/he feels like working hard in math when the teacher threatens him/her with negative consequences if work is not done.

0. None. No threats/punishments mentioned.

1. Loss of privileges. Student will miss recess, gym, or other activities if work is not completed or done correctly.

2. Extra time/requirements. Student will have to stay after school or otherwise spend time doing the work as a punishment or the student will have to do extra work as a punishment (extra page, more problems) if the assignment is not completed.

3. Long term negative consequences. Student will work hard if the teacher communicates long term negative consequences (e.g., you'll flunk, you'll be held back).

4. Other. Specify.

F. Motivational Statements/Activities

0. None.

1. It's enjoyable. Student will work hard if teacher communicates that the assignment will be fun and easy.

2. It's challenging. Student will work hard if the teacher communicates that the assignment will be hard, challenging, or tricky.

3. It's important to learn. Students will work hard if the teacher communicates that the assignment is really important for the future (It'll be on the test, need it for next year, etc.).

4. Rewards. NOTE: These two are broken down in previous coding categories.

5. Punishments. NOTE: These two are broken down in previous coding categories.

6. Math games/competition. Teacher gives students an opportunity to play math games or engages them in math competitions. This makes the student work hard.

7. Time limits/constraints. Students will work hard if teacher states a time limit or imposes time constraints for complete/accurate work.

8. Gives easy work. Teacher gives the student easy/familiar work. This makes the student work hard.

9. Teacher personal appeal. Students will work hard if the teacher makes a personal appeal (e.g., "Do this for me" or "I will be very happy if you do well," etc). The students work hard in an effort to please the teacher.

10. Build self concept. Students will work hard if the teacher tries to build their self concept by identifying, calling attention to, and building on strengths and successes.

11. Other relevant-specify.

12. Other irrelevant-specify.

G. Rewards/Punishment for Accuracy, Completion or Effort?

When the student mentions reward/punishment, does s/he indicate whether the rewards/punishments are for completion of work, accuracy, or effort?

0. Can't rate.

1. Completion.

2. Accuracy/quality of work.

3. Effort/hard work.

H. Interviewer Repetitions

How many times does the interviewer repeat the question before the student makes an initial response?

I. Interviewer Probes

How many times does the interviewer probe to get a complete response?

## N. Directions for Coding Student Interviews

1. You will be coding two statements simultaneously.

2. Coding sheets for Student Preferences (Part I) consist of three sections. The first section is for codes that are specific to each pair (Codes A-H). The second section is for coding statement specific codes (Codes I-J). When coding categories in the second section, consider all instances in which a given statement appears as part of the pair. The third section (Code K) should be coded on the basis of the student's entire response to Part I (Students' preferences and rationales).

3. When entering codes on the sheets, please make sure that codes related to the two statements in each paired comparison are entered in the appropriate columns. Since two adjacent columns are used to enter codes, there is a possibility of accidentally moving the codes to another column. PLEASE BE CAREFUL.

4. Since the students may focus on only one statement of any given pair, the other statement in the pair may get coded 0 on most of the categories. However, for Category A, both statements get coded (e.g., if Statements 3 and 8 are paired and the student prefers 3, then 3 gets coded A1 or A2 and 8 gets coded A0).

5. Each time a statement appears as part of a comparison, code all parts pertaining to that statement.

6. IMPORTANT. Start coding responses associated with each comparison after reading the subject's entire response to that pair.

7. The cover sheet has an abridged version of the coding system. This sheet should be used only after you are completely familiar with the detailed description of each category.

Coding of the Open Ended Questions. (Parts II, III)

1. The cover sheet should be used only after you are thoroughly familiar with the detailed description of each category.

2. In the description of each category, there are examples of some typical responses that would get coded in the category, However, when coding a subject's response, make sure that the codes are consistent with the intent and meanings built into the coding system. Thus, an unusual response that nevertheless embodies the key concept of defining a category should be coded in it, but a response which contains a seemingly relevant word or phrase but does not really embody the key concept should not be coded in that category.

## DIRECTIONS FOR RESOLVING DIFFERENCES BETWEEN CODERS

1. Each coder should code the transcripts independently.

2. Mark the codes clearly on the transcripts. Since most of the coding categories are low inference categories it should be easy to mark the parts of a student's response that reflect a certain code.

3. When coding high inference categories or those categories that require rater judgments, make sure you have a clear rationale. This rationale is important when explaining this code to the other coder and helpful in resolving differences. If possible, mark sections of the response that justify your codes.

4. Do not discuss your coding with the other coders while you are in the process of initial coding.

5. When resolving, make sure both coders' codes are marked on a new coding sheet. This sheet should identify codes of both the coders. If there is complete agreement on any of the categories, then enter only one set of codes.

6. Where codes are different, each coder should explain why they coded the transcript a particular way. Through the process of discussion, come to a consensus on what codes are to be final. In each category, circle the final codes.

7. If consensus cannot be reached on particular codes, ask a third person who is familiar with the coding system to break the tie.

8. After final codes are determined for all the categories, note down the final codes on a new coding sheet. This should be done in the following way: One coder reads the codes and the other coders writes them down. This is to insure that there are no errors in the process of transferring the codes from one sheet to another. Having final codes on a new sheet also minimizes errors when the data are later transferred to computer sheets.