Teacher and Student Discourse Variables in Academic Communication

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TEACHER AND STUDENT DISCOURSE VARIABLES
IN ACADEMIC COMMUNICATION

by
Janet M. Sturm

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Speech Pathology
and Audiology

Western Michigan University
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This study was designed to analyze the oral communication exchanges between first, third, and fifth grade teachers and their students. It was based on the hypothesis that discourse parameters of linguistic quantity and complexity and communication acts change over grade level, much as the discourse parameters of caregivers with young children have been found to do. The language of teachers and students in 15 classrooms was examined by measuring 6 form and quantity variables and 11 communication act variables. Results showed significant differences for some form variables (MLU, mazes, and Type-token ratio) and some communication acts (convey content, mark content, solicit students). A major purpose of the study was to gather evidence regarding the linguistic demands placed upon students that will be helpful in planning relevant language intervention services for them. The results regarding proportion of talking time will provide information about opportunities that children have to use their language skills in the classroom.
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Janet M. Sturm
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Teacher and student discourse variables in academic communication

Sturm, Janet M., M.A.

Western Michigan University, 1990

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CHAPTER I

INTRODUCTION

Being a successful student in the elementary school classroom requires that a student be both linguistically and socially competent (Erickson, 1981). The elementary school student must master not only the language of the classroom across a variety of subjects and settings but also the social interpersonal rules about when to talk and when not to talk (Lindfors, 1987). Gruenewald and Pollack (1984) stressed the importance of the relationship between linguistic and cognitive development and the expectations of academic task as a way of understanding school success.

The need for additional information about the interplay between student discourse styles and teacher expectations has been emphasized repeatedly (Green, 1983; Hymes, 1972). A need has been recognized for more complete knowledge about the interaction between communicative contexts and the communicative processes of learning (Green, 1983). Understanding the communicative contexts of teaching can lead to a better understanding of their relationship to academic task requirements and students' learning performance.

Currently, attention is also being focused on how
much students are allowed to participate in the classroom environment. Questions about opportunity for participation are particularly important for students with language disorders. How much and what types of access and opportunity for communication do students actually have in the regular education classroom? Such questions can help determine whether students with special needs can be competitive, active, or merely included in educational settings (Beukelman, 1989) and whether their communicative needs can be adequately met in those contexts.

Previous research has indicated that two-thirds of oral interaction in the classroom is controlled by teachers (Cazden, 1988; Flanders, 1970). This dominance of talking time by teachers has important implications for making decisions to place children with language disorders in general education classrooms. In such a case, it is important to ask how much opportunity both general education students and language-learning impaired students might be given to participate communicatively in regular education classrooms at different elementary grade levels.

Purpose

The current study addressed the oral interactions between general education teachers and their students. Its primary purpose was to study grade level changes in teacher and student language complexity and discourse roles. A
secondary purpose was to examine the opportunities that children have to use their language skills in regular classrooms. This information will contribute to understanding the kinds of skills language-learning disabled students need in order to be successful in general education classrooms and to decisions made about placing them in those classrooms.

Definition of Variables

In order to answer the questions about academic discourse characteristics and opportunities, forty-five 90-minute tape recordings (45 minutes in the morning and 45 minutes in the afternoon) were made in 15 classrooms by placing a tape recorder in each for 3 consecutive days. A corpus of nine minutes of group instruction and discussion was transcribed and coded from each of the 90-minute tape recordings. This resulted in 27 minutes of discourse being transcribed and analyzed for each of the 15 classrooms.

A two-factor study was designed using the two independent variables: (1) grade level (1st, 3rd, or 5th), and (2) speaker type (teacher or student). From the transcribed samples, a set of 17 dependent variables was identified and divided into 2 subgroups: (1) linguistic quantity and complexity, and (2) communication acts. These are operationally defined in the following ways.
Linguistic Quantity and Complexity

1. Total number of measured words produced in the 27 minutes of tape transcribed over 3 days.
2. Total number of utterances produced.
3. Mean Length of utterance (MLU) measured as morphemes per T-unit (Hunt, 1965).
4. Number of types of unique words produced.
5. Type-token ratio (TTR) measured as number of different types of words divided by number of total words.
6. Proportion of utterances containing mazes, defined as reformulations, meaningless repetitions, hesitancies, false starts, and abandoned utterances (Loban, 1963), which represent linguistic breakdowns due to linguistic demands on the speaker.

Communication Acts

Communication acts were indexed with the following variables that were stimulated by Dore's (1979) Categories of Primary Conversational Functions, General Conversational Classes, and Particular Conversational Acts:

1. Direct acknowledgments, including the categories:
   a. Neutral evaluations acknowledging responses but not expanding or extending them (e.g., "Mhm," "alright" or "Oh dear, sound serious" (immediately following a student answer)) [AE].
b. Positive evaluations directly acknowledging the correctness of speaker responses (e.g., "good job") [AE+].

c. Negative evaluations directly acknowledging the incorrectness of speaker responses (e.g., "No, that's not it") [AE-].

2. Indirect acknowledgments, including modifications of responses by repeating them, sometimes with extensions or expansions:

a. Acknowledgments providing or indicating a need for modification of speaker responses (e.g., "Not quite, it's paraffin") [AM].

b. Acknowledgment through repetition of speaker responses (no new information is added) (e.g., Student "Forty-two," Teacher "Forty-two") [AR].

c. Negative acknowledgment through repetition plus an evaluation indicating incorrectness of speaker responses (e.g., "Forty-two?" [with questioning intonation]) [AR-].

d. Positive acknowledgment through repetition plus an evaluation indicating correctness of speaker responses (e.g., "Yes, forty-two") [AR+].

e. Acknowledgment through repetition plus extension to content of speaker responses (e.g., Student "Forty-two," Teacher "Yes, forty-two is right when you multiply six by seven") [ARE].

3. Speaker conveys attitude about curricular expectations, topics, or activities (e.g., "Some people had
4. Speaker conveys content [CC] (e.g., "The author of this book is E.B. White") or repeats content (e.g., (immediately following the above statement) "E.B. White is the author") [RC] about the curriculum.

5. Speaker conveys classroom procedures (e.g., "Walk around the outside of the desks") [CP] or repeats classroom procedures (e.g., (immediately following the above statement) "Walk around the outside") [RP].

6. Marking the content for transitions between activities, between concepts or marking the content of speaker responses through oral cues (e.g., "ok," "now," or "Today we're going to be working on multiplication") [MC].

7. Solicitation of individuals (e.g., "What is the answer, John?") [SO].

8. Solicitation of requests for action or information.
   a. Soliciting action (e.g., "Open your books") [SA].
   b. Repeat solicit action (e.g., (immediately following soliciting the above action) "Books open please") [RSA].
   c. Soliciting information (e.g., "What could the answer be?") [SI].
   d. Repeat solicit information (e.g., (immediately following the above statement) "What is it?" [RSI].

9. Supply of solicited information (e.g., Teacher:
"What day is it?" Student supplies information: "Tuesday"

10. Performative (e.g., "Please" or "Thank you") [P].

11. Free Response made by student that may or may not have pertained to the topic being discussed (e.g., "I haven't gone yet") [FR].

Experimental Hypotheses

The overall experimental hypothesis was that teachers and students would make adjustments in their oral language structure and function as grade level increased. Null hypotheses of particular interest (and their comparison experimental hypothesis) included the following:

1. No overall multivariate differences for teachers and student by grade level. The experimental hypothesis was that grade level differences would occur.

2. No difference in syntactic complexity (measured as MLU of T-units) for teachers or students. The experimental hypothesis was that syntactic complexity would increase as a function of grade level.

3. No difference in mazes produced by teachers or students at different grade levels. The experimental hypothesis was that mazes would increase as a function of grade level.

4. No differences in proportion of words produced by
teachers or students. The experimental hypothesis was that the proportion of teacher talking time would exceed that of students at all grade levels.

5. No differences in the number of communication acts produced at each grade level. The experimental hypotheses were that: (a) teacher acknowledgements would remain similar across grade levels, (b) teacher utterances used to convey content would increase across grade levels, and (c) teacher utterances used to solicit information would decrease as a function of grade level.
CHAPTER II

REVIEW OF THE LITERATURE

Macroanalytic to Microanalytic Study of the Classroom Environment

In order to understand educational contexts and the variety of demands placed on students within those contexts, researchers from a variety of disciplines have been examining general education classrooms for a number of years. Educational research is conducted in such disciplines as linguistics, education, ethnography of communication, psychology, anthropology and sociology. Variables studied have included: language complexity, communication acts, language quantity, and proportion of talking time.

Two general types of research have been conducted in an attempt to better understand the learning environment of the classroom. The first type, macroanalysis, involves examination of classrooms from a holistic perspective by looking at event structures in the classroom. This type of research has revealed types of curricula and other events (e.g., transitions and morning routines) that occur in general education classrooms. It is important that perspective because it is events that control, in part,
the language of the classroom. The second type of discourse analysis, microanalysis, involves examination of the specific instructional conversations that occur during classroom events. Results of both types of educational research can provide information about classroom events and their relationship to language produced within them.

From a macroanalytic perspective, researchers have examined particular activity structures to better understand classroom processes and events, to find more precise descriptions of classroom regularities, and to develop systematic knowledge of both the generic and the unique features within classroom interactions (Berliner, 1983; Bloome & Knott, 1985; Mehan, Hertwick, Combs & Flynn, 1982). In describing an ethnographic study of classroom discourse, Green (1983) stated that "the ways in which teachers used language and constructed contexts and activities through language placed different demands on students for learning how to participate" (p. 193). Green (1983) commented that examination of macro-level features alone may mask differences in language use between tasks. It was suggested, instead, that micro-level patterns of behaviors need be analyzed in order to understand better the relationship between teacher language, the context in which it occurs, and the demands placed upon students for learning how to participate.

In the current study, primarily microanalytic procedures
were used. Earlier microanalytic studies have investigated such variables as rate, syntax, and speech acts (e.g., Cazden, 1988; Cuda & Nelson, 1976; Flanders, 1970; Riggin, Miller, Jadd & Warr-Leeper, 1985; Sinclair & Coulthard, 1974; and Wilkinson & Calculator, 1982). Microanalysis of classroom discourse structures provides insight into the evolution of instructional conversations. Information from microanalytic studies can aid not only in providing information about specific communicative structures within the classroom but also in understanding how these structures affect and are affected by classroom event structures.

Demands of the Curriculum: Microanalytic Perspectives on School Discourse

The language used by teachers in the classroom has been compared to the language of caregivers in that it is adjusted based on the perceived communicative competence of listeners (Anderson, 1978; Cazden, 1988; Cuda & Nelson, 1976; Mehan et al., 1982). Similarities have been found between teachers and middle-class caregivers in adjustments of pitch, intonation, enunciation, sentence length, repetitions, and number of questions asked of children of different age levels (Anderson, 1978; Cazden, 1988).

Although the language of teachers has been compared to the language of caregivers, and many similarities have been
found, it is also important to point out the differences between educational and home contexts. Wells (1986) emphasized that in the school curriculum students often must "disembed" their thinking from the contexts of their own experiences. They also must handle ideas in classroom that are abstract and for which their personal experiences may provide only minimal support.

These differences between home and school environment may place increased demands on children relative to the demands of home as they attempt to be successful students. Parents modify their language when talking to young children by using short grammatically simple utterances, exaggerating intonation, emphasizing key words, limiting topics to what is familiar to the child, and often repeating or paraphrasing themselves (Snow & Ferguson, 1977; Wells, 1986).

In one study of classroom discourse, Cuda and Nelson (1976) investigated the language of general education teachers at first, third, and sixth grade levels and found that teachers accommodated their language to children of different grade levels in a similar way to that in which child caregivers have been observed to accommodate their language to children of different age levels. In that study, rate and complexity of language used by teachers increased systematically as a function of grade level, with rate increasing significantly from first to third grade.
level and syntactic complexity increasing significantly from third to sixth grade level.

A second study was cited by Cazden (1988). It was a doctoral dissertation that reviewed research on both baby talk and teacher talk (Anderson, 1978). In her summary of Anderson's dissertation Cazden (1986, 1988) reported that teacher language is modified in similar ways to caregiver language in that teachers also use a higher pitch, exaggerate intonation, use more repetitions of content, and ask more questions than in adult-to-adult conversation. The particular language used by teachers was termed "teacher-talk" register by Cazden (1988). She differentiated this teacher-register from parents' language by several features unique to teacher talk. In particular, she noted that teachers talk approximately two-thirds of the time, initiate almost all interactions, interrupt but are not interrupted, and express control over both behavior and talk itself. In addition, teacher language does not always relate directly to topics that are familiar to the child, whereas parent language usually does.

Student talk, as it occurs in classrooms, is sometimes referred to as "student-talk register" (Cazden, 1988). This register is described as being related to teacher expectations. It is not characterized by how students talk naturally, but by ways that many teachers expect them to talk during academic instruction. Mehan (1979) commented
that "to be successful in the classroom, students not only
must know the content of the academic subjects, they must
learn the appropriate form in which to cast their academic
knowledge" (p. 133). In order to be a competent member of
the classroom, a student must know the rules for playing
the classroom game (Simon, 1985). Students who do not know
or understand the "rules of the game" risk a high frequency
of unsuccessful interactions with their fellow students and
teachers. Furthermore, students who do not understand
social situations and communicative demands may risk
learning little from the classroom environments in which
they participate (Wilkinson & Calculator, 1982).

It has been hypothesized (Gruenewald & Pollack, 1984)
that, in many cases, the difficulty that students with weak
language skills have in answering teachers' questions
correctly may be due not to lack of knowledge on the part
of the students, but to inappropriate complexity, increased
rate, and the proportion of talking used by teachers.

Gruenewald and Pollack (1984) also indicated that
multiple concept directions used in instructional language
may cause difficulties for some students. They theorized
that "The student may understand one or two concepts but
may not be able to remember or order all the concepts that
are present in the direction" (p. 10).

When considering student language expression, Wells
(1986) commented that teachers bring the meaning into the
conversation of the classroom; therefore, it is also not surprising that some students have "little to say or even appear to be lacking in conversational skills altogether" (p. 87) in the classroom. It is hypothesized that incongruency between the teacher and students during an instructional task is indicative of different frames of reference and may lead to breakdown in the learning process (Wells, 1986).

The communicatively competent student, on the other hand, uses context clues to "read" the signal system of the classroom to communicate in ways that are not only intelligible, but also appropriate and effective (Erickson, 1982). Mehan (1979) described the subtleties of classroom procedures that students are required to follow in classroom interactions. For example, students must be able to follow non-verbal cues that allow them to take the floor or to realize when a teacher cue permits them to contribute directly as a group. In describing the tasks facing children in schools, Nelson (1989) commented that:

School experiences challenge children to use their oral and written language in unique ways to comprehend, remember, recall, and express information. To the extent that children have sufficient language skill to process the spoken and written language of education and to connect it to nonverbal context and prior knowledge, they are able to do what children call "getting it," by comprehending and participating in the broadest sense of their own learning. (p. 171)
Microanalytic Perspectives on Language Complexity

Many researchers have examined the complexity of syntax used by mothers to small children (Snow & Ferguson, 1977; Wells, 1986). Others have examined the communication acts between teachers and students (Bellack, Kliebard, Hyman, & Smith, 1966; Flanders, 1970; Mehan, 1979). However, information about the complexity of syntax produced by elementary education teachers to their students remains limited. As Nelson (1985) noted, the language form used in teacher talk may influence the ease or difficulty students have in processing it, creating yet another demand on the skills of the language-learning impaired student.

The complexity of language form was examined by Cuda and Nelson (1976) in speech samples gathered in time-based audio recordings of 27 teachers (9 at each of the grade levels 1st, 3rd, and 6th). Two measures were used to estimate the syntactic complexity of teachers' utterances, Miller's synthetic word counts (1975), and mean length of utterance (MLU) (Brown, 1973). Results revealed that the language of teachers increased in complexity as a function of grade level for both word counts and MLU. The language of sixth grade teachers was found to be significantly more complex than the language addressed to either first or third graders.

Riggin et al. (1985) conducted a similar study to that
of Cuda and Nelson. The study was unpublished, and the
details are sketchy, but twenty-one general education
teachers in kindergarten through grade eight were reported
to participate. From these, two teachers were apparently
selected from each grade level (18 total) for microanalytic
procedures. Each teacher was recorded for an entire day
and three lessons (one each from math, reading, and
language arts) were used to provide the corpus. Utterances
were divided during transcription so that each utterance
contained at least one complete intonation contour
terminated by a minimal pause of one second (Garvey &
Beringer, 1981). Between 50 and 100 utterances were
analyzed to obtain a Syntactic Complexity Formula Score
(SCFS) (Granowsky, 1971), mean length of utterance for
intonation units, and mean length of utterance for T-units
(Hunt, 1970). Although similar variables were used by
Riggin et al. (1985), to those measured in the Cuda and
Nelson study, Riggin et al. found that teachers' speaking
rate and complexity did not vary as grade level increased,
although vocabulary levels did. The language of the two
individual teachers at each grade level varied
substantially in the Riggin et al. study and it was not
clear how the statistical analysis was performed, so it is
difficult to know how to interpret the results. However,
Riggin and his colleagues concluded that students in the
elementary grades may be required to process language which
is equal in length and complexity to the language presented to children in grade eight.

The studies conducted by Cuda and Nelson (1976) and Riggin et al. (1985) both addressed selected teacher discourse variables, but neither included analysis of the oral language used by students. It was the purpose of the current study to examine classroom discourse as a whole, including both students and teachers.

**Student Perceptions of Microanalytic Events**

Students' perceptions of the functions of classroom language were investigated through indirect interviews conducted by Morine-Dershimer (1985). This study provided additional information regarding students' perceptions of oral instructions/discussion in the classroom and showed areas in which teacher language may be ambiguous and may result in communication breakdown. The subjects were six teachers and 165 pupils in one second grade, three third grades, and two fourth grades. A portion of the study focused on what pupils identify as units of language in classroom interaction, as opposed to what researchers typically identify as units of language in the classroom. Following observations of four minute segments of classroom discourse students were asked, "What did you hear anybody saying?" Each pupil response was labeled a "unit" of language identified by that pupil. Units of language were
then categorized as being simple, compound or complex. Students reported what they heard people saying in simple units of language. For the study a unit of language was defined as "report of a verbal event that closely approximated the actual utterance, but provided no information beyond the utterance" (p. 46).

A measure of "information load" was also defined and used to measure the degree of complexity of information units. Simple units contained one unit of information, compound units contained two units of information, and complex units contained three or more items. From the responses given by a pupil, all items of linguistic information were totaled and divided by total number of units of linguistic information. Results revealed that over the period of one school year, students were able to process increased information load and information complexity as their classrooms became more familiar. In addition, as the school year progressed, students seemed to report more actual language and more linguistic information (Morine-Dershimer, 1985). Results of this research support contentions made by Gruenewald and Pollack (1984) that the degree of familiarity of a classroom affects students' abilities to perceive language forms and to process them.

Language Fluency of Teachers and Students in the Classroom

Linguistic "mazes" were originally defined by Loban
(1963) as disfluencies in oral discourse that appear in the form of hesitations, false starts, and meaningless repetitions. They represent the breakdown in the flow of oral language caused by linguistic demands on the speaker. Mazes in students' and teachers' language may be indirect indicators of linguistic complexity. Mazes may also serve as a window to thought processes of speakers.

Clark and Peterson (1986) stated that "Teaching behavior is substantially influenced and even determined by teachers' thought processes" (p. 255). They commented further that "teachers' thought processes are affected greatly by the task demands on the teacher and by the teachers' perceptions of the task" (p. 258). Oral language is a product of teachers' thought processes. One hypothesis in this study was that increasing linguistic demands, would be associated with increased mazes in teachers' language as grade level increased.

Verbal mazes produced by students were also of interest. Wittrock (1986) discussed students' thought processes and how teaching affects students' overall classroom behavior by influencing what they "think, believe, feel, say, or do" (p. 297). For the most part, students are required to act as passive respondents in the classroom by answering the many questions and requests posed by their teachers. The conversational constraints of these discourse acts on the student limit the range of meanings students can express.
and also account for the high number of fragments and ellipses found in students' utterances (Wells, 1986). Both conversational constraints placed by teachers on students and increased content and complexity of language produced by students may lead to an increased number of mazes produced over advancing grade level.

Loban (1963) examined language fluency of 338 students, kindergarten through grade six, through individual interviews with each subject. Subsequent analysis of mazes in students' language during these interviews actually revealed a steady decrease in the number of mazes and words in mazes from year to year. Loban hypothesized that the decreased number of mazes in students' language was due in part to their increased proficiency in oral language usage. The study conducted by Loban did not examine students' language during actual instruction/discussion events, however, but rather through individual interviews with each student. Conversational constraints within the classroom and increased linguistic demands on students that may contribute to increased mazes as a function of grade level were not examined.

Opportunities for Communication

Teacher talk not only dominates in number of utterances produced but also in directing the flow of the interaction (Morine-Dershimer, 1988). Flanders (1970), in a discussion
about teacher contact with students, noted that "teaching behavior is the most potent, single, controllable factor that can alter learning opportunities in the classroom" (p. 13). Teachers, as the directors of classroom discourse, place conversational constraints on conversational flow and other communication interactions within the classroom by doing such things as directing conversational bids for the floor and managing the direction of the topic (Wells, 1986).

In discussing the conversational constraints placed on general education students, Wells (1986) commented that:

Not only do the children speak less with an adult at school. In those conversations they do have, they get fewer turns, express a narrower range of meanings...and use grammatically less complex utterances. They also ask fewer questions, make fewer requests, and initiate a much smaller proportion of conversations. (p. 87)

Constraints are placed on teachers as well as students. For example, constraint is placed on the teacher by the curriculum itself as educators emphasize standardization of both the curriculum and teachers' accountability for it (Wells, 1986).

Shultz, Florio, and Erickson (1982) elaborated on constraints on teacher discourse and the concept of teacher control in their discussion about participation structures within classroom units. They stated that during large group instruction, the greatest constraints occur because
negotiation and management of interactional rights becomes increasingly difficult for the teacher.

Results of research on proportion of talking time in general education classroom has consistently shown teachers to dominate classroom dialogue (Bellack et al., 1966; Cazden, 1988; Flanders, 1970; Ramirez, 1988). As a general rule, it has been suggested that two-thirds of the classroom time is teacher talk, and only one-third consists of student talk (Flanders, 1970). Gruenewald and Pollack (1984) hypothesized that many teachers are not aware of how much time they actually spend talking and what effect that might have on their students. They urged teachers to have predetermined educational objectives and to be aware of when students are comprehending instructional messages. Otherwise the danger is that increased time will be spent in a confusing question cycle between students and teachers (Gruenewald & Pollack, 1984), and "an excessive amount of talking tends to create nonlisteners, or at best, passive confused listeners" (p. 50).

Wells (1986) also pointed out that "a discussion with the whole class almost inevitably involves the majority of the children as listeners only" (p. 107). Therefore, the one-third talking time that students have been reported to have is typically dominated by a minority of students. One aspect of learning involves sharing one's knowledge. If a minority of students is sharing knowledge, then many
students are missing opportunities to share what they have learned. They may also be missing opportunities to clarify areas of misunderstanding with their teachers. Students with language-learning disabilities can be expected to have particular difficulty gaining access to communication events in this highly competitive environment.

Communication Acts

Communication acts are described as the things that a speaker does with the production of an utterance (Austin, 1962; Searle, 1969). Several early researchers described communication acts in the language of young children (e.g., Halliday, 1975; Dore, 1974). Communication acts in academic discourse have been studied extensively over the years through a variety of methods (Bellack et al., 1966; Flanders, 1970; Mehan, 1979; Morine-Dershimer, 1985; Ramirez, 1988; Sinclair & Coulthard, 1974).

In conducting communication acts analysis, studies initially focused on a limited set of categories that were pre-determined by the researchers for coding each act in mutually exclusive ways (i.e., each utterance could only receive one code). The frequency of various interactions was quantified.

These earlier quantification studies were criticized, however, by Mehan (1979), who believed that the quantification focused primarily on teacher discourse and
did not accurately portray the contributions made by students. Recent research has begun to focus on more discrete categories (e.g., differentiation between "real" vs. known-answer questions) (Ramirez, 1988) and on the students' perception of "rules" governing discourse and "features" of classroom language considered most important by both teachers and students (Morine-Dershimer, 1985).

Research conducted by Bellack et al. (1966) analyzed the language of the classroom as a system rather than isolated features. Verbal interactions were treated as pedagogical moves in a game. Bellack and his colleagues believed that, due to situational constraints, certain acts should occur in patterns, one affecting the other.

Sinclair and Coulthard (1975) conducted a more linguistically oriented analysis by focusing on the roles of grammatical forms and content in the conversational moves of the classroom. A hierarchical structure was built in which conversational acts built up into moves. These structures combined, formed the instructional and conversational boundaries.

Results of these studies established the question-answer sequence as the most frequently occurring pattern of conversational acts. For example, a common sequence was found to consist of initiation by the teacher, response by the student, and feedback from the teacher. These studies were criticized, however, for setting up an artificial
experimental situation through the use of pre-determined lessons (Gumperz, 1981).

One of the most broadly used classroom interaction analyses was designed by Flanders (1970) as a set of predetermined and mutually exclusive codes for categorizing spontaneous verbal communication. Based on Flanders' system, several common patterns of communication acts were found. For example, short questions and short answers were found to occur in a sequence. The focus of Flanders' work was to analyze patterns of teaching and learning for the purpose of improving classroom instruction. Teachers-in-training continue to be taught to use Flanders' system to analyze their own teaching discourse.

Mehan (1979) also supported the theory that individual acts of classroom discourse are not autonomous but occur in connected sequences. His research revealed a similar interactional sequence to that found by Bellack et al. (1966) and Sinclair and Coulthard (1974). Mehan, however, labeled the communication act sequence: teacher initiation, student reply, teacher extend/evaluate (IRE). This IRE sequence has become a common referent used by researchers describing classroom communication (Cazden, 1988).

In an effort to focus on more discrete categories than those criticized in earlier studies, Ramirez (1988) designed a study to examine the functions of utterances.
within a hierarchical framework of "act-move-exchange." Morine-Dershimer (1985) commented on the coding of communication acts in Ramirez's (1988) study as differing from previous ones in making three important distinctions: (1) "real" versus "known" information questions; (2) "personal" versus "nonpersonal" informatives; and (3) the coding of "meta-statements." A pattern of exchanges was found. For analysis, communication acts were further categorized as having three classes of moves: opening, answering, and follow-up. Opening moves consisted of initiation, convey content, or solicit response. Answering moves were considered to occur in relation to opening moves and follow-up moves provided feedback to the listener by accepting, modifying or evaluating. In the Ramirez study, categories of speech acts were found to differ in concentration within opening, answering, and follow-up moves. For example, most acts were found to be teacher initiated and there was a higher "density" (i.e., number) of acts within an opening move than in an answering move.

Two portions of a study conducted by Morine-Dershimer (1985) focused on "features" of language in the classroom and on students' perceptions of the "rules" governing discourse in classroom lessons. Results regarding "features" of language in the classroom showed that pupils' perceptions of classroom language were not random or haphazard, but that certain patterns of student
understanding of classroom discourse were identifiable. Findings about students' perceptions of discourse "rules" revealed that no strong student agreement existed on the rules for asking and answering questions in the classroom. It was suggested that this may be a primary area for communication breakdown between teachers and students. Morine-Dershimer hypothesized that if sources of communication breakdowns can be identified, it may be helpful to teachers who feel that particular students are not behaving appropriately.

As Ervin-Tripp (1982) has pointed out, a teacher needs to consider that children who fail to do what is expected may not be uncooperative, but rather, may not understand. In such instances, other causes, such as a misinterpretation by the student of the teacher's social cues, may be causing the breakdown. Additional causes of communication breakdown may be ethnic or social class differences.

Summary

Traditionally, the learning environment of the classroom has been examined from two perspectives: macroanalytic analysis of event structures and microanalytic analysis of linguistic interactions within event structures. Information from both perspectives is needed in order to better understand the interaction
between communicative contexts and the communicative processes of learning. The current study was designed at a microanalytic level to examine the linguistic interaction within a single macro-discourse event structure, that of group instruction and discussion.
CHAPTER III

METHOD

Overview

This study was designed to examine communicative interactions between general education teachers and their students. The general hypothesis was that language form and discourse variables within teacher and student utterances would vary as a function of grade level. The major purpose of the study was to gather evidence regarding linguistic demands placed upon students in elementary school classrooms. A secondary purpose was to examine the opportunities that children have to use their language skills in regular classrooms.

Fifteen first, third, and fifth grade teachers (5 at each grade level) and their students served as subjects in this study. Six 45-minute audio recordings of morning and afternoon classroom instruction were made in each classroom over a three-day period. From the audio recordings, a corpus was transcribed which included only classroom events involving group instruction and discussion. Because more instruction and discussion of this type tended to occur in the morning, six minutes were transcribed from the morning and three minutes were transcribed from the afternoon.
From this corpus, the language of teachers and students at three grade levels was examined by measuring 28 variables grouped within the 2 main parameters: (1) language quantity and complexity, and (2) communication acts. These variables were then analyzed using a multivariate analysis of variance (SAS Institute Inc., 1985). For the MANOVA, language complexity variables were collapsed to 6 different dependent variable measures, and communication acts were collapsed to 11 different dependent variable measures.

In this chapter, research procedures are described under the headings of Subjects, Data Gathering, Corpus Selection, Analytical Procedures, and Reliability Checks.

Subjects

Subjects were 15 teacher volunteers and their students from four school districts located in southwestern Michigan. These teachers represented 5 classrooms each at the grade levels, first, third, and fifth. The total number of student subjects at 1st, 3rd, and 5th grades were 127, 114, and 136 respectively. Teachers were informed of being potential subjects through principals at their schools. The investigators then met with each individual school staff in a group meeting with the teachers and principals to further discuss the study prior to their agreeing to participate. These teachers were informed that the study was designed to examine the way students and
teachers talk, but they were not informed of the specific variables being measured. Teachers then volunteered their willingness to participate (or not). Of the first grade teachers invited to participate in the first round of requests, eight volunteered and none declined. Of the third grade teachers invited to participate in the first round of requests, seven volunteered and eight declined. Of the fifth grade teachers invited to participate in the first round of requests, five volunteered and ten declined. The first five teachers in each category who could be scheduled (and produced the tapes that could be used) served as subjects. For 2 third grade teachers the tape recorder malfunctioned. Potential student subjects and their parents were informed of the study through letters (see Appendix B) from their school district. These procedures were approved by the Western Michigan University Human Subjects Institutional Review Board (see Appendix A). No students or parents declined to participate.

Each of the participating school districts was located in a semi-rural region of southwestern Michigan. The socioeconomic status of the four districts was also similar. Districts 1, 3, and 4 were described by their superintendents as ranging from middle- to working-class populations. District 2 was described by its superintendent as ranging from upper-middle to working class populations. During the 1988-89 school year the four
school districts ranged in size from 1797 students to 2380 students (Kindergarten through grade 12) (see Appendix C). One district contained a higher multi-ethnic population due to a university in the region that had a high international student enrollment. For the study, teachers were asked to identify their own ages and the number of years and various grades they had taught when they gave their permission to participate in the study. The data of the 15 teachers (5 at each grade level) and their students are shown in Appendix D.

The first grade teachers included 5 females, the third grade teachers included 4 females and 1 male, and the fifth grade teachers also included 4 females and 1 male. The average years teaching was 15, with a range of 1 to 28 years. The average age of the teachers was 42 years, with a range of 31 to 61 years (see Appendix D). All of the teachers had lived exclusively in the Midwest states of Michigan, Indiana, and Ohio with three exceptions. That is, two teachers had lived for some time in Eastern states (New York, 18 years; and Pennsylvania, 18 years) and one teacher had lived for some time in a Southern state (Alabama, 18 years).

The transcribed audiotapes were coded so that individual teachers would not be identifiable. Privacy of individual teachers was also protected by transcribing "XX" for surnames, with one "X" for each syllable contained in the
surname (e.g., Mrs. Baumgartner would be transcribed as Mrs. XXX). First names only were used for children.

Data Gathering

Each of the 15 teachers and their students were recorded for 3 consecutive school days in the morning and the afternoon. The recording equipment consisted of a Maranz PMD 221 cassette tape-recorder set on automatic loudness control (ALC) to reduce background noise and target speech. All teachers were asked to place the recorder in an area of the classroom where they were likely to conduct most oral interactions. This was done prior to the students' arrival at the school.

The recorder was activated by the classroom teachers when they began instruction in the morning and they were instructed to let it run for the 45-minute duration of the tape. Prior to the beginning of the afternoon session each teacher was asked to turn the tape over and repeat the procedure (See Appendix E). Additional manipulation was not required of the teachers. Although teachers were instructed to let the tape run during times in which the class left the room (e.g., for special curricular activities outside the classroom), this rule was not followed by all teachers. For example, one teacher announced to the class that it was time to leave for a special activity and turned off the recorder when leaving
the classroom; another turned off the recorder when reading aloud to the class for a length of time. By leaving the tape recorder on in each classroom, six 45-minute tape recordings were made for each classroom. The taping of classrooms was conducted during second semester, 1989. The first classroom was taped on February 22, 1989, and the last classroom was completed on April 14, 1989.

Corpus Selection and Transcription Rules

Each audio tape was listened to by the primary investigator and segmented into macro event structures of classroom activities. Instruction/discussion segments were determined according to the following rules:

Included in the corpus were:
1. Student sharing time;
2. All curriculum instruction addressed to the class as a whole;
3. Instructions for the class agenda;
4. Instructions for transitions; and
5. Statements addressed to an individual but judged to be for the benefit of all.

Excluded from the corpus were:
1. Small group reading instruction; and
2. Segments of instruction/discussion directed only to an individual student.

Segmented events were timed by the researchers using a
stop watch. Side A of each tape was morning instruction and side B was afternoon. Preliminary analysis revealed more instruction discussion segments in the morning. Therefore, it was decided that more instruction/discussion time would be taken from the morning.

Only those classroom events labeled by the researchers as instruction/discussion were transcribed. Two 3-minute segments of instruction/discussion were transcribed from side A of the tape and one 3-minute segment was transcribed from side B. Although each tape contained 90 minutes of tape recorded classroom events, obtaining 9 minutes of instruction/discussion to transcribe was found to be difficult for several of the tapes. This was due to a limited occurrence of instruction/discussion events on some of the days. The problem obtaining a 9-minute corpus may be due to the recorder not being turned on exactly as specified. It was to be activated as soon as instruction/discussion began. However, if teachers forgot to turn on the recorder until later in the morning, the occurrence of special events outside the classroom (such as music or recess) would interfere with accurate recording of instruction/discussion events.

For transcription, the first 3 minutes of classroom event segments that were categorized as instruction/discussion were transcribed. If the instruction/discussion segment was longer than 3 minutes,
the researcher stopped transcribing at 3 minutes and forwarded the tape to the next classroom event containing instruction/discussion. For side B, the first 3 minutes of instruction/discussion were transcribed. If side A of the tape did not contain two full 3-minute instruction/discussion segments, the needed amount of corpus to complete 6 minutes was taken from side B. If side B did not contain 3 minutes of instruction/discussion, the needed amount of corpus to complete 3 minutes was taken from other parts of side A.

Transcribed segments of instruction/discussion were those that contained three or more T-Units of teacher language. If a silent period occurred within an instruction/discussion segment, or if the class was determined to be off the instructional task for 10 seconds or more, this part was deleted from the instruction/discussion corpus. Following a silent period or off-task segment, transcription began again at the point in which there were 3 or more T-units of instruction/discussion teacher language.

Other Transcription Rules

The variables of linguistic quantity, complexity, mazes, talking-time proportions, and communication acts were based upon 9-minute segments of instruction/discussion taken from each tape over the three-day period (27 minutes
total for each classroom). Each 9-minute corpus was transcribed using the conventions established for the Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 1986) software and an IBM compatible computer. For the identifying line on the SALT files, students were listed as the first subject, teachers as the second. When students provided a choral response, it was coded on the student line as "G" rather than "S". The following rules were used for transcribing utterances into the SALT files:

1. Mazes were transcribed and enclosed in parentheses.
2. Most abandoned utterances were placed into mazes unless the utterance was determined to stand alone in meaning.
3. Unintelligible segments were coded as XXX.
4. One X was used per syllable spoken.
5. Extra comments pertaining to the corpus were enclosed in {} brackets. For example, {teacher laughs} or {student unintelligible}.
6. Quotation marks were placed around language that was read aloud, vocabulary words, and individual phonemes (e.g., The "D" in "dog" needs to be a capital).

No attempt was made to control the content of the academic discourse. Topics of varied curricular areas were taught during taping. Classrooms were audio taped for 3 consecutive days in an attempt to obtain a more representative sample of their normal schedule of events.
It was felt that the three day schedule would result in a sample that would also be more neutral in reactivity to the presence of the recording device. However, there is no way of knowing how much the presence of the tape recorder might actually have influenced the nature of the discourse interactions. Evidence of students' reactivity to the recorder was apparent on rare occasions. However, it typically consisted of infrequent comments made by students directly into the recorder as they passed by it, not during times of group instruction/discussion. In one case students asked why the recorder was there. When this happened, teachers were instructed to tell students that people from Western Michigan University wanted to know more about what goes on in classrooms. Further questions about the recorder were not asked by this class. The strongest reactivity appeared at one isolated point when two to three students did not want to speak aloud in class due to the recorder being on. This teacher proceeded to call on a student she felt was not reacting to the recorder. Classroom instruction/discussion continued at that point.

Analytical Procedures

The dependent variables examined in this study were categorized into two subgroups: (1) linguistic quantity and complexity, and (2) communication acts.
**Linguistic Quantity and Complexity Variables**

These were variables that indexed various aspects of language quantity and complexity. They were operationally defined as follows:

1. One quantity measure was the **number of total words** (called word "tokens") produced by teachers' and students' (the two speaker types) in the 27 minutes of tape transcribed over 3 days.

2. **Mean Length of Utterance** was used as an index of linguistic complexity of teachers' and students' language. It was made possible through division of the corpus' utterances into "minimal terminable units" (T-Units) (Hunt, 1965, 1970). Minimal terminable units were defined by Hunt (1965) as "one main clause plus all the subordinate clauses attached to or embedded within it" (p.20). Clauses beginning with "because" were considered to be subordinate and remained attached to the related T-unit. Linguistic complexity as measured in MLU for T-units was computed by counting the total number of measured utterances produced in the 27 minutes of tape transcribed over three days.

Minimal terminable units are considered to be a valid measure of written complexity (Loban, 1963). As a measure of written complexity T-units have demonstrated clear patterns of development, or at least change, and it has been confirmed repeatedly in later research that T-units
are a better predictor of grade levels than any of the other measures of written complexity (Hillocks, 1986). T-units were also used by Riggin et al. (1985) to provide a measure of oral language complexity. Most recently, Ramirez (1988) reported using T-units as his division for meaning units in a study of communication acts in the general education classroom. In this study, MLU of T-units was computed by the SALT computer program (Miller & Chapman, 1986), using the rules for counting morphemes recommended by Brown (1973).

3. A second measure of linguistic quantity was the number of utterances (T-units) produced within the 27 minutes of tape transcribed over the 3-day period. Separate counts were taken for the number of utterances produced by teachers and by students for each of the 15 classrooms.

4. The number of unique words (called word "types") produced was measured by counting the total number of unique words produced in the 27 minutes of tape transcribed. Separate word-type counts were made for teachers and students.

5. The type-token ratio was calculated by dividing the number of different types of words produced by either teachers or students by the total number of words produced by that type of speaker in the 27 minutes of tape transcribed.
6. **Language fluency** was measured by placing linguistic disfluencies, known as "mazes," (Loban, 1963) (i.e., hesitations, false starts, and meaningless repetitions) in parentheses as specified in the SALT program (Miller & Chapman, 1987). Mazes are defined as "a series of words or initial parts of words which do not add up, either to meaningful communication or to structural units of communication" (Loban, 1963, p. 8). The total number of mazes for each teacher and each group of students for the three-day period were used in the analysis.

**Communication Act Variables**

Communication acts of teachers and students were examined using a coding system stimulated by Dore's (1979) Categories of Primary Conversational Functions, General Conversational Classes, and Particular Conversational Acts. For this study, 22 separate conversational acts were devised based on the classroom discourse samples rather than on pre-established codes.

In this study, utterances were coded after they were divided into T-units (Hunt, 1965). Each T-unit was eligible to be coded for one or more communication act. This choice to allow the possibility of more than one code per utterance was based on Heap’s (1982) criticism that mutually exclusive codes (such as those devised by Flanders (1970)) fail to recognize the multifunctionality of
utterances. In the current system, it was recognized that utterances (events) can serve more than one communicative purpose. Multifunctional analysis of utterances also aided in accounting for interrelation among utterances. The 22 communication acts were divided into the following 11 categories for statistical analysis:

1. Direct acknowledgments, including the categories:
   a. Neutral evaluations acknowledging responses but not expanding or extending them (e.g., "Mhm," "alright," or "Oh dear, sounds serious" (immediately following a student answer)) [AE].
   b. Positive evaluations directly acknowledging the correctness of speaker responses (e.g., "good job") [AE+].
   c. Negative evaluations directly acknowledging the incorrectness of speaker responses (e.g., "No, that's not it") [AE-].

2. Indirect acknowledgments, including modifications of responses by repeating them, sometimes with extensions or expansions:
   a. Acknowledgments providing or indicating a need for modification of speaker responses (e.g., "Not quite, it's paraffin") [AM].
   b. Acknowledgment through repetition of speaker responses (no new information is added) (e.g., Student: "Forty-two," Teacher: "Forty-two") [AR].
   c. Negative acknowledgment through repetition plus
an evaluation indicating incorrectness of speaker responses (e.g., "Forty-two?" [with questioning intonation]) [AR-].

d. Positive acknowledgment through repetition plus an evaluation indicating correctness of speaker responses (e.g., "Yes, forty-two") [AR+].

e. Acknowledgment through repetition plus extension to content of speaker responses (e.g., Student: "Forty-two," Teacher: "Yes, forty-two is right when you multiply 6 by 7") [ARE].

3. Speaker conveys attitude about curricular expectations, topics, or activities (e.g., "Some people had attractive covers") [CA].

4. Speaker conveys content [CC] (e.g., "The author of this book is E.B. White") or repeats content (e.g., immediately following the above statement) "E.B. White is the author") [RC] about the curriculum.

5. Speaker conveys classroom procedures (e.g., "Walk around the outside of the desks") [CP] or repeats classroom procedures (e.g., immediately following the above statement) "Walk around the outside") [RP].

6. Marking the content for transitions between activities, between concepts or marking the content of speaker responses through oral cues (e.g., "ok," "now," or "Today we're going to be working on multiplication") [MC].

7. Solicitation of individuals (e.g., "What is the answer, John?") [SO].
8. Solicitation of requests for action or information.
   a. Soliciting action (e.g., "Open your books") [SA].
   b. Repeat solicit action (e.g., (immediately following soliciting the above action) "Books open please") [RSA].
   c. Soliciting information (e.g., What could the answer be?" ) [SI].
   d. Repeat solicit information (e.g., (immediately following the above statement) "What is it?" [RSI].
9. Supply of solicited information (e.g., Teacher "What day is it?" Student supplies information "Tuesday") [SSI].
10. Performative (e.g., "Please" or "Thank you") [P].
11. Free Responses made by students that may or may not have pertained to the topic being discussed (e.g., "I haven't gone yet") [FR].

Reliability Checks

Inter-judge reliability checks of the experimental variables were made between members of the research team. This consisted of independent transcription of the same corpus at random points in order to confirm the accuracy of the corpus utterances and T-unit division. Intra- and inter-judge reliability checks of communication acts coding was also conducted through independent coding of the same corpus. Intra-judge reliability showed 94% agreement, and inter-judge reliability showed 86% agreement.
Computation and Transformation of Variables

Counting of the seventeen dependent variables was accomplished by using the conversion program SALTFILE (Miller & Chapman, 1987). SALTFILE is a variable file utility program that can be used to create rectangular files for synthesis of data (Miller & Chapman, 1987). It was used to count and report quantities for each of the listed variables for each of the 45 separate transcriptions. Following this, the data for each classroom had to be combined for the three days. This was done by placing the values for all of the variables in a spreadsheet program (EXCEL; Microsoft, 1985,1987). The spreadsheet program was used to average proportion scores for the three day period (MLU,TTR) and to compute proportion of talking time. This was done by adding together the total number of words used by the teacher (or by students) in a classroom over the 3 days of tape transcriptions and then dividing by the number of words used by both the teacher and the students (using the EXCEL spreadsheet program). The same computation procedure was used for both speaker-types. The spreadsheet program was also used to produce totals for the variables that represented counts of coded events. Later, a decision was made to transform count variables to proportion variables in order to normalize their distribution. This was done by
dividing all variable counts by the total number of T-unit utterances produced by that speaker-type (teacher or students) in that classroom over the three day period.

Statistical Analysis

This study contained two independent variables: (1) speaker type (teacher and student), and (2) grade level (1st, 3rd, or 5th). Because the experimental design of this study included these two factors plus 15 dependent variables, a multivariate analysis of variance (MANOVA) was performed, using the SAS statistical package (SAS Institute, Inc., 1985). For this analysis, linguistic quantity and form variables were studied with one MANOVA procedure, and the communication act variables were studied in a separate MANOVA. Performatives and free responses were eliminated from this MANOVA because they occurred with such low frequency. Results are reported in Chapter IV.
CHAPTER IV

RESULTS

This study examined changes in classroom discourse by using a two-way factorial design. The factor of grade level included the three levels, 1st, 3rd, and 5th grade, serving as one independent variable. The factor of speaker-type included the two types of speakers, teachers and students, serving as the second independent variable.

Multiple dependent variables were grouped into two major parameters. These were characterized as: (1) language form and quantity variables, and (2) communication acts. Language form and quantity were examined by using 6 indices, which were defined and discussed in Chapter III. Communication acts were divided into 22 separate conversational acts for the coding of transcripts. For statistical analysis, the 22 conversational acts were collapsed into eleven categories (see chapter III).

Because the statistical design of this study contained multiple dependent variables, a multivariate analysis of variance (MANOVA) was performed, using the SAS (1985) statistical package to measure grade level effects and correlation between variables. An a priori confidence level of $p < .05$ was established.
Form Variables: MANOVA Results

Rather than looking at straight counts, some of the dependent form variables (and all of the communication act variables) were transformed to proportions in order to normalize their distribution so that the assumption of MANOVA could be met. Log transformations of proportions were also used to confirm a multivariate normal distribution.

The F statistic used for measuring multivariate tests of significance was Pillai's Trace. Pillai’s Trace is considered to be the most robust criterion because the significance level based on it is reasonably correct even when the assumptions are not exactly met (SPSS Inc, 1988).

Table 1 presents the means (and 3-day totals in the cases of total words and total utterances) for the quantity and form variables. It also illustrates the areas where significant differences were found in subsequent analysis.

Testing the Effects

The significant overall MANOVA results led to examination of the source of the differences. First, the interaction effect was examined and was not found to be significant ($F = 1.189; p < .3$). That is, the null hypothesis of no overall interaction effect was not rejected. Because of no overall interaction, it was
acceptable to test the main effects (SPSS, 1988). Testing the main effects of the two-way factorial design revealed that the null hypothesis of no speaker type difference was rejected (F = 76.332; p < .001). The suspected differences between quantity and form of teacher talk when compared with the quantity and form of student talk was confirmed. The null hypothesis of no grade level effect was also rejected (F = 2.304; p < .02). This finding supported the experimental hypothesis that grade level differences would appear.

Further Analysis of Form Variables: Pair-Wise Comparisons

After finding significant main effects for each of the two independent factors in the experimental design, post hoc pair-wise comparisons for each of the dependent variables were conducted.

Table 1
Summary of Quantity and Form Means by Grade Level

<table>
<thead>
<tr>
<th>Quantity &amp; Form Variables</th>
<th>Students</th>
<th></th>
<th>Teachers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st</td>
<td>3rd</td>
<td>5th</td>
<td>1st</td>
</tr>
<tr>
<td>*1. MLU (morphemes/T-units)</td>
<td>3.7</td>
<td>4.6</td>
<td>4.8</td>
<td>7.5</td>
</tr>
<tr>
<td>*2. % Utt. with mazes</td>
<td>11%</td>
<td>20%</td>
<td>22%</td>
<td>6%</td>
</tr>
<tr>
<td>*3. Type-token Ratios (TTR)</td>
<td>.67</td>
<td>.62</td>
<td>.57</td>
<td>.40</td>
</tr>
<tr>
<td>4. Tot. Utt. Prod.</td>
<td>100</td>
<td>160</td>
<td>114</td>
<td>415</td>
</tr>
<tr>
<td>5. Tot. Wds. Prod.</td>
<td>397</td>
<td>524</td>
<td>418</td>
<td>2666</td>
</tr>
<tr>
<td>6. % of Tot. Wds. Produced</td>
<td>20%</td>
<td>27%</td>
<td>23%</td>
<td>80%</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
variables were conducted to see which variables contributed to the overall differences. These comparisons showed significant differences between teachers and students for every form variable except for mazes. Further pair-wise comparisons were made to look for grade level differences within the teacher category and student category separately.

Results of pair-wise comparisons for grade level differences for teacher MLU indicated that first and third grade teachers were alike and both were significantly different from fifth grade teachers. That is, fifth grade teachers demonstrated a significant increase in MLU over that produced by either 1st or 3rd grade teachers. No significant differences as a function of grade level were found for students.

Proportion of teacher utterances including mazes was found to differ significantly from first to third grade. First grade teachers produced a significantly smaller proportion of utterances with mazes. Differences in proportion of teacher utterances with mazes between third and fifth grades were not significant. Analysis of proportion of student utterances with mazes indicated a significant difference between first and fifth grade levels. Third grade student maze proportions were not significantly different from those for either first or fifth grade students.
Results of pair-wise analysis of type-token ratios for students showed a significant difference (a decrease) from first to fifth grade. The TTR for third grade students was found not to be significantly different from either first or fifth. Results for the type-token ratios of teachers were not significantly different as a function of grade level.

As indicated in Table 1, pair-wise analyses of the final three form variables were not significant as a function of grade level for either teachers or students. These variables included: (1) total utterances produced, (2) percentage of words produced, and (3) percentage of total words produced.

Communication Act Variables: MANOVA Results

Rather than looking at straight counts, the dependent communication act variables were transformed to proportions to normalize their distributions. Log transformation of proportions for these variables confirmed a multivariate normal distribution.

Two communication act variables, performatives and free responses, were omitted from the final analysis due to their infrequent occurrence. Table 2 presents the mean percentages (and standard deviations) for communication act variables which have been transformed to represent
proportion of total utterances produced by that speaker type.

Table 2  
Summary of Communication Act Means by Grade Level

<table>
<thead>
<tr>
<th>Communication Act Variables</th>
<th>Students</th>
<th></th>
<th></th>
<th>Teachers</th>
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<tbody>
<tr>
<td></td>
<td>1st 3rd 5th</td>
<td>1st 3rd 5th</td>
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<tr>
<td>1. % Utt. to convey content</td>
<td>3% 6% 7%</td>
<td>18% 24% 27%</td>
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<td></td>
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<tr>
<td>2. % Utt. to mark content</td>
<td>1% 1% 2%</td>
<td>18% 20% 27%</td>
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<tr>
<td>3. % Utt. to call on student</td>
<td>0% 1% 0%</td>
<td>15% 10% 9%</td>
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<td></td>
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<tr>
<td>4. % Utt. to convey procedure</td>
<td>0% 0% 1%</td>
<td>23% 22% 23%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. % Utt. to convey attitude</td>
<td>2% 1% 1%</td>
<td>9% 11% 6%</td>
<td></td>
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</tr>
<tr>
<td>6. % Utt. to acknowl. eval.</td>
<td>1% 0% 1%</td>
<td>8% 7% 5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. % Utt. to acknowl. modify</td>
<td>0% 0% 0%</td>
<td>9% 11% 8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. % Utt. to ask questions</td>
<td>5% 8% 12%</td>
<td>33% 28% 29%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>or solicit action</td>
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<tr>
<td>9. % Utt. to answer questions</td>
<td>61% 51% 55%</td>
<td>1% 2% 3%</td>
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<tr>
<td>or read aloud when Asked</td>
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</tbody>
</table>

*Significant at the .05 level

Testing the Effects

Analysis of interaction effects for communication acts indicated a significant difference ($F = 2.133; p < .03$). The null hypothesis of no overall speaker-type by grade level interaction therefore was rejected. In further testing, the null hypothesis for the main effect speaker-type difference was rejected ($F = 115.607; p < .0001$). This indicated significant differences between
teacher and student proportion in all areas of communication act variables. However, the null hypothesis regarding no overall effect of grade level ($F = 1.459; p < .17$) failed to be rejected. Because of the significant interaction effect, separate null hypotheses were tested for the two different speaker-types, teachers and students. Regarding students by grade level effects, the null hypothesis failed to be rejected ($F = .671; p < .81$). However, the null hypothesis ($p < .003$) for teacher by grade effect was rejected ($F = 2.133; p < .03$).

*Further Analysis of Communication Act Variables: Pair-Wise Comparisons*

Pair-wise comparisons of each of the communication act variables were conducted to see which variables contributed to the overall differences. Communication act variables which were found to be significantly different for teachers as a function of grade level included: (a) the percentage of utterances used to convey content, (b) the percentage of utterances used to mark content, and (c) the percentage of utterances used to call on students. These variables are noted in Table 2 with an asterisk. Results indicated no significant difference for any of the communication acts as a function of grade level for students.

Results of pair-wise comparisons for the percentage of utterances used to convey content indicate that first grade
teachers were significantly different from fifth grade teachers. Third grade teachers were not significantly different from either first or fifth grade teachers. Fifth grade teachers demonstrated a significant increase in the amount of content conveyed to students over first grade teachers. No significant differences in conveying content occurred as a function of grade level for students. In fact, the students rarely conveyed content.

The percentage of utterances used by teachers to mark content was found to differ significantly from first to fifth grade, with fifth grade teachers (27%) marking content significantly more frequently than first grade teachers (18%). Third grade teachers did not differ significantly from either first or fifth in their proportion of utterances used to mark content. Analysis of student utterances used to mark content revealed no significant differences as a function of grade level.

Examination of the percentage of utterances used to "solicit others" (i.e., to call on specific children) revealed significant differences as a function of grade level for teachers. In pair-wise comparisons, first grade teachers were found to differ significantly from both third and fifth grade teachers. Differences in percentage of utterances used by teachers for calling on children were not significant between third and fifth grades. No significant differences were noted between grades for
student utterances used to solicit children or the teacher.

Pair-wise analyses were not significant for any of the other 6 communication act variables as a function of grade level for either teachers or students. These variables included: (1) the percentage of utterances used to convey procedure, (2) the percentage of utterances used to convey attitude, (3) the percentage of utterances used to acknowledge evaluate, (4) the percentage of utterances used to acknowledge modify, (5) the percentage of utterances used to ask questions or solicit action, and (6) the percentage of utterances used to answer questions or read aloud.
CHAPTER V

DISCUSSION

This study examined the language of the elementary school classroom according to two major parameters: (1) linguistic quantity and complexity, and (2) communication acts. For statistical analysis, language quantity and complexity were examined by using 6 indices and communication acts were examined by using 11 indices (see Chapter III for definitions). Two communication act variables, performatives and free responses, were omitted from the statistical analysis due to their infrequent occurrence, yielding a final total of 15 dependent variables. A two-way factorial design was used to measure changes in classroom discourse as a function of both: (1) grade level (1st, 3rd, and 5th), and (2) speaker-type (teachers and students).

The results of the study do suggest that there are significant grade level differences for some of the dependent variables. These results will be discussed separately for each of the 15 dependent variables. The form variables, MLU (morphemes/T-units) and percentage of utterances with mazes, showed significant differences for teacher language (see Chapter IV). Students demonstrated
significant grade level increases in mazes and type-token ratios.

Qualitative Examples of Grade Level Differences and Similarities

Quantity and Complexity of Language

Pair-wise comparison of 6 quantity and complexity variables revealed two variables that differed significantly as a function of grade level for teachers: (1) MLU (morphemes/T-unit), and (2) the percentage of utterances containing mazes. Students were found to differ significantly across grade levels for: (a) the percentage of utterances containing mazes, and (b) type-token ratios (TTR). The following sections will discuss qualitative information across grade levels for significant form variables and will then discuss those variables that were not found to be significant as a function of grade level.

Mean Length of Utterance for Teachers

Post hoc pair-wise comparisons of grade level differences for Mean Length of Utterance MLU (morphemes/T-unit) indicated that first and third grade teachers were alike and both were significantly different from fifth grade teachers. The analysis did not include words contained in mazes, and because fifth grade teachers produced a significantly greater proportion of utterances
with mazes, grade level differences may have been even greater than the results suggest. The significant grade level difference for MLU support the results of prior research in which the language complexity of teachers was found to be similar for first and third grade and increase significantly in the sixth grade (Cuda & Nelson, 1974).

The accord in the results of these two studies provided additional confirmation that teachers do accommodate their language similar to the way caregivers accommodate their language when speaking to their children. The following examples illustrate how MLU differs in the language of math instruction between first and fifth grade teachers. Such differences contribute to increased processing demands on students' listening systems. Contrast this series of simple sentences produced by a first grade teacher, with the more complex math instruction language of a fifth grade teacher:

Leo, will you tally for us today? Now it's getting a little bit harder. This is three things to add together. Ten plus five plus two. How much is that?

As an example of fifth grade syntactic complexity consider the following:

Ok, and Sarah is going to be very similar to the one that Don did because she added three tenths and two tenths, came up with five tenths, both divided by five.

Third grade teachers were like first grade teachers in terms of MLU, but different from fifth grade teachers.
However, there may have been some contributions to listening complexity that were not analyzed in this study. The following example demonstrates some of the multiple meaning words and the rapid shifts in discourse that students may be required to process in a third grade classroom.

And you'll dip it down into the wax, hold it, dip it down in the wax and hold it. And we'll set up a nice little loop for the classroom with paper so that you can just cruise around the classroom. Now anyone who chooses not to follow classroom rules, (which) which (reminder) we are prepared for a classroom to keep hands and feet and objects to ourselves. Hot paraffin can be very dangerous.

**Mean Length of Utterance for Students**

The MLU (morphemes/T-unit) of students' language was not found to increase significantly as a function of grade level. Short utterances across grade level represent the linguistic constraints of the classroom. Flanders (1970) discussed the short question, short answer sequence typical of classroom discourse. During most academic events students are expected to use short utterances. For example, one third grade teacher was asking what the most important thing students should do before a test. Individual student responses included: "concentrate," "thinking," and "listening." These short utterances have implications for the speech-language pathologist who is encouraging students to "say the whole thing." Results
like these also represent the limited opportunities that students have to use linguistically complex utterances in the classroom, and they suggest that it may be premature to abandon pull-out therapy for language learning impaired students. Pull-out opportunities may be needed to allow students with communication disorders to practice complex language structures since their opportunities are so limited in the classroom.

Mazes in Student Talk

Mazes were found to increase significantly as a function of grade level for both students and teachers. However, teachers and students were not significantly different from each other in the proportion of utterances with mazes. In fact, this is the only variable for which significant teacher-student differences did not appear. A significant difference was found in the proportion of words with mazes between first and fifth grade levels for both teachers and students. Third grade teachers and students were not found to be significantly different from those in either first or fifth grade for this variable. This finding for students is in contrast to a study of mazes in students' language in first to sixth grade conducted earlier by Loban (1963). Loban interviewed students and found that as students became increasingly linguistically competent across grade levels, disfluencies decreased. In this
study, disfluencies increased. However, the two studies differed in the type of discourse event studied. Dyadic conversational interviews make different discourse demands on children's processing systems than group classroom discussions do. It is felt that although students do become increasingly competent language users across grade levels from 1st to 5th, a variety of demands can result in increased disfluencies in the classroom environment.

Classroom events that did allow for longer student utterances, such as sharing time, were where the majority of mazes were found to occur. Several possible reasons may be suggested for this observation. Even during sharing time students appear to be aware of time constraints of the classroom, and they may feel a need to increase the rate of their utterances. Also students' opportunities to share using long utterances are limited. When they do get an opportunity to do so they must be able to formulate the utterances, decide what is important, and also know the type of language expected by the teacher.

Although first grade students were found to have significantly fewer disfluencies, the following example shows normal nonfluency in the first grade classroom:

(A jaw, a jaw) a flight figure (and, and I brought his) and I brought his packets too.

The language of a third grade student during sharing time is demonstrated in the following example:
And (it's um) I jumped on it. But (um, right that um) and other (um) logs caught me.

A second third grade student stated:

(Um) yesterday, (we went to um) we went to this place that we always go.

Although "Show and Tell" events largely disappear by fifth grade, other kinds of sharing do occur, and they tend to elicit the same disfluent language characteristics from students. For example, one fifth grade classroom conducted a sharing time event to discuss books that had been read silently in their seats. The following sample is taken from that sharing time:

How these girls and (this, this) this lady got divorced with (um). (I don't know what the girl's mother is what the girl's, what the girl, well her name is well) her parents got divorced, and now she has a rich father. How she'll telling lies about him (that) that (he will) he knows.

The lack of complexity illustrated by these short utterances and the high rate of disfluency in language produced by a presumably normally developing student makes one wonder how it is possible for general education teachers ever to identify language learning impaired students within their classroom based on their oral language characteristics alone. It suggests that referral of students should rest on multiple criteria, and not just on oral production difficulties.
Mazes in Teacher Talk

Teachers also demonstrated a significant increase in the proportion of utterances with mazes as grade level increased. Analysis revealed that first grade teachers produced significantly fewer disfluencies than either third or fifth grade teachers. Factors that may affect the fluency of teachers may include: time constraints, needs to control both student behavior and their own talk simultaneously, and overall linguistic demands. An example of disfluency in the speech of a first grade teacher is demonstrated in the following example:

(But but, however, its) maybe start to see rain instead of so much snow.

The following example illustrates the significant increase in mazes at third grade level, presumably related to increased linguistic demands:

(Ahm) area people, they sort of talked to a lotta area people (that are) they were not too happy with something that's happened in about the last week.

The communication act analysis showed a significant increase in the amount of content conveyed in teachers' utterances of the fifth grade classroom. The next two examples demonstrate the variety of concepts a fifth grade teacher may have to draw upon. Such complexity may contribute to the production of mazes. For example:
Can you remember: (what we) how far (we) we owned?

"So (the um they were afraid that us) who owned the port in New Orleans?

**Type-Token Ratios**

Pair-wise analysis of type-token ratios (TTR) for students showed a significant difference (a decrease) from first to fifth grade. The TTR for third grade students was not significantly different from either first or fifth. TTR was not significant by grade level for teachers. This significantly higher TTR of .67 for first grade students over the TTR of .57 for fifth grade students is probably merely an artifact of the smaller sample size at the first grade level. Hunt (1969) originally cautioned that TTR was extremely sensitive to varying sample size. This is because samples naturally yield higher TTRs due to the limited set of function words. These words are not repeated as often in a short sample as in a larger one. More recently, Hess, Haug, and Landry (1989) reported evidence that TTR was not a reliable index of the language performance of elementary school children. Therefore, the significant results in this study for TTR are viewed cautiously.
Non-Significant Quantity Variables

Total Words and Total Utterances

Although no statistically significant differences were found for the two form variables, total utterances produced and total words produced, a trend was found for more talking by third grade students than by students in either first or fifth grades. First grade students produced an average of 397 words over the 3 day (27 minutes) transcribed period. Third grade students produced an average of 524 words, and fifth grade students produced an average of 418 words. For teachers, the average number of words produced showed a steady (though non-significant) increase with grade level (2666, 2714, 3032), co-occurring with a steady (but non-significant) decrease in total number of utterances (415, 405, 359). These findings are reflected in the significant increase in MLU which appeared from first and third to fifth grade (discussed previously).

Total Words Produced

Proportion of talking time in these samples was measured by comparison of student to teacher language in percentage of total words produced. Results support earlier research suggesting that teachers dominate classroom talking time. However, in this study teachers, rather than producing approximately 2/3 of the total words, were found
to dominate even more. That is, in this study, teachers were found to talk approximately 3/4 of the time across the grade levels, whereas, students received only 1/4 of the talking time. Again, this demonstrates the constraints on the language of students in the classroom and the limited opportunity students have to participate. The caution that should be remembered in interpreting these results is that only instruction/discussion events were transcribed (see definition in Chapter III). It is possible that students do get more opportunities to talk during other classroom events.

**Communication Acts**

For teachers, 3 out of 9 communication act variables analyzed were found to be significantly different as a function of grade level. They were: (1) the proportion of utterances used to convey content, (2) the proportion of utterances used to mark content, and (3) the proportion of utterances used to solicit other. Students did not differ significantly across grade levels for any of the communication act variables analyzed. Qualitative information for communication act variables found to be significantly different across grade level will be discussed in the following sections. A discussion about those variables that were not found to be significantly different as a function of grade level will follow.
**Convey Content**

Pair-wise analysis of the percentage of utterances used by teachers to convey content revealed significant differences as a function of grade level. Third grade did not differ significantly from either first or fifth. An increase in the content conveyed was found from first to fifth grade. This increase suggests that a greater amount of information is conveyed in instructional language as grade level increases. Content conveyed in the first grade classroom is shown in the following example of instruction about written language:

> This is the body of the letter. And we're gonna capitalize the first word in a sentence.

In the fifth grade classroom, the teacher is required to convey more content as concepts become increasingly complex. This is demonstrated in the following fifth grade instruction segment about writing metaphors and similes:

> Ok, down here it says "in the poem the writer compares the wind to a galloping horse." However, it does not say the wind is like a horse. She tells us only that the wind gallops. The rest is left to our imagination. The poorest comparison is a metaphor. A metaphor resembles a simile that is also a comparison between two things that are really different but have something in common. So really, comparing the wind with a horse, the thing they have in common is their movement. It's like the gallop of a horse. A metaphor, however, does not contain the words "as," "like," or "than."

The content and complexity of the language in samples like this one have implications for language-learning impaired
students who may be less prepared to process such complex instructional language.

**Mark Content**

The percentage of utterances used by teachers to mark content was found to differ significantly from first to fifth grade, becoming greater as a function of grade level. Third grade teachers were not found to be significantly different from either first or fifth grade. The increased marking of content by teachers from first to fifth grade may represent the need for teachers to mark the rapid shifts in discourse as the content and complexity of classroom language increase. Because utterances containing the word "ok" were also coded as mark content, the cue may, however, be very subtle and ambiguous to student listeners. An example of first grade teachers marking of content is contained in the statement:

*We're gonna have to start up now.*

Students who followed this cue probably changed their behavior to indicate readiness and were better prepared for what was about to follow.

In fifth grade, content marking may be used increasingly by teachers to indicate when they want students to recall and remember. This is demonstrated in the following example:

*Ok, remember, their house has blown up.*
Students following such cues can begin to build a mental picture, preparing themselves for the content that follows.

**Solicit Other**

Examination of the percentage of utterances used to solicit students' individual participation revealed significant differences in teacher by grade level use. First grade teachers were significantly different from both third and fifth grade teachers in use of this communication act (they used it more frequently). Significant differences were not noted between third and fifth grade teachers.

The use of solicitation of individuals serves a variety of purposes for first grade teachers. It is a direct representation of the "rules of the classroom game" where individuals are chosen to take the speaking floor. Students must learn when to talk and when not to talk (Lindfors, 1987). In its most direct form, the solicit other communication act provides the solicitation of individuals as in the first grade example:

*What month is his birthday in, Christy?*

In later grades, students can follow more subtle cues from the teacher for taking the speaking floor such as a "Mhm" or a finger point. First grade teachers may also use the solicitation of individuals to draw a student's attention to the lesson as demonstrated in the example:
Nathan, we're going to listen for the long blind "a," the long blind "e," "o," "u," and "i."
The solicitation of individuals by first grade teachers may also serve to make sure a student is prepared for what is about to follow as represented in the following example:

Garrett, did you find it?

Given the variety of functions that direct solicitation of individuals may serve for the first grade teacher, it is not surprising that it occurred in significantly greater frequency than in either third or fifth grade. As students master the "classroom game," and as the language of the classroom becomes increasingly decontextualized, the cues from teachers for allowing students to take the floor become more subtle and may not be as readily apparent on audio recordings.

Convey Procedure

No significant difference was found in the frequency of which teachers conveyed procedures across grade levels. Although the conveying of procedures by teachers was used with almost equal frequency across grade levels, the complexity of procedures teachers talked about and their distribution of occurrence did appear to differ with grade level. First grade teachers typically conveyed procedures in smaller groups of one to three T-units. Fifth grade teachers were more likely to convey many procedures at once in large chunks of T-units. For example, one first grade
teacher reviewed the pragmatic rules of the classroom:

(Ah) wait until everyone gets set for now. We don't want any noise. Everyone just reads and we listen to Sarah.

First grade teachers also appear to frequently review the rules of the classroom. For example, consider the following examples of procedures for completing a worksheet:

We're going to be using glided vowel words. We're going to be listening for "a," "e," "i," and "o," "u." saying their names. On the back you have to write the name of each picture.

A third grade teacher is represented in the following example when discussing the procedures for completing a worksheet:

(I) you (ch) wanna put an "x" over the one if you're changing and then (ok) remember the word has to (be) read well on both of them. That's why I'm going back.

The clustering of procedures conveyed by fifth grade teachers as compared to first grade teachers is demonstrated in the following example:

I've collected most of the state notebooks. And I have them over on my desk. And I will be going through them and checking them off (ah) looking for using the outline you wrote them with and checking to see how well you followed the outline. The things I will be checking for will be do you have all the parts of the report in your report. The parts that were on the outline. And there was to be a section about geography, one about climate, another one about natural resources, another one concerning industry, history, tourist information, other information, then your illustrations and your map. And I will be going through to see if you have all of those parts.
The above example represents the teacher not only conveying procedures involved in report writing but also conveying content about things that are included in a report, and expressing feelings about what will be checked in order to have completed a successful paper. This sample points out the fact that procedures are not conveyed in one step directions, as they are often targeted in speech-language intervention, but rather occur in lengthy sequences and mixed within other communication acts.

**Convey Attitude**

The proportion of utterances used to convey attitude did not differ significantly across grade level. An average of 8% of utterances (T-units) were used in first, third, and fifth grade classrooms. Attitudes conveyed by teachers went beyond evaluation of the correctness of student responses. They were used to convey the importance and purpose of certain instructional events, and to indicate what type of behaviors might be needed in order to be a successful student (i.e., to please the teacher). The following fifth grade comment about report writing provides an example of what students need to do in order to be successful in the classroom:

Some students had attractive covers.

Teachers' use of statements to convey attitudes about student behavior serves as subtle pragmatic cues about the
hidden-curriculum of the classroom (Nelson & Sturm, 1990). Because language learning impaired students may not grasp such subtle cues, they may sometimes demonstrate inappropriate classroom behaviors or turn in unsuccessfully completed classroom assignments.

**Acknowledge Evaluate and Acknowledge Modify**

The proportion of utterances used by teachers to acknowledge responses in an evaluative way did not differ significantly by grade level. The range of occurrence of these communication acts from first to fifth grade was 5 to 8%. Utterances used to acknowledge evaluate served the functions of indicating when responses were correct, incorrect, or to acknowledge their occurrence in a neutral manner. Both negative and neutral evaluations were infrequent in occurrence (an average of 5% and 4% respectively) as compared to an average use of 17% for positive evaluations. It was observed that teachers were less likely to use direct negative evaluation. When a negative response is warranted, teachers instead tended to use acknowledge modification. The following sample demonstrates a first grade teacher's use of an acknowledge modify communication act rather than an acknowledge negative act, apparently in order to buffer the negativity of the evaluation:
Student: It's a last person's name.
Teacher: It's a proper name, isn't it?

Acknowledge modification acts used by teachers were not found to differ significantly across grade level. An average of 9% of utterances served to acknowledge modify. As stated above they functioned to buffer students' inaccurate responses. Additional examples of acknowledge modify acts included "not quite" and "close".

Solicit Information

No significant difference across grade levels was found in the frequency with which teachers asked questions. An average of 30% of utterances (T-units) were used to solicit information in first, third, and fifth grade classrooms. One function of solicitations asked by teachers was to obtain information from students; however, these solicitations were used for many other purposes. Solicitations by teachers to students were used to convey content (rhetorical questions), to solicit action (behavior control), to mark content (e.g., "remember?") and to check for clarification. Teachers use of a variety of solicitation forms (some of which are subtle) may be difficult for the language-learning impaired student to grasp. For example, understanding the difference between "real" versus "known-answer" questions may be difficult. These indirect forms of solicitations begin as early as the first grade, as demonstrated in the following example.
of a first grade teacher indirectly soliciting action:

You're not in your desk.

Students who pick up on this cue for action would understand that they should return to their seats; others might not.

Another example of indirect statements used to solicit action occurred in the following third grade sample. The teacher attempted to change the students' talking through a long pause in the middle of her utterance:

This morning we will have a little bit of> {at this point the teacher waited until the students settled down}.

Examples of a fifth grade classroom teacher soliciting information to clarify or to "check for understanding" are illustrated in the following questions:

You don't understand it?
... Everyone see that now?

Although student utterances did not differ significantly in the proportion used to ask questions, there was evidence of an upward trend from first (5%) and third grades (8%) to fifth grade (12%). As students increased in grade level they appeared to be more likely to ask clarification questions during periods of misunderstanding or a communication breakdown. For example, during a written language instruction event these third grade students were asking about rules used for punctuation:
Don't you have to put a comma after I?

Don't you have to put a comma between "I" and "am"?

An example of a fifth grade student requesting clarification occurred during the checking of assignments. The following statement illustrates a student soliciting information about which assignment she needed to have ready:

Teacher: Ok, this was page one ninety-four.
Student: Yesterday's?
Teacher: Yesterday's assignment.

**Answer Questions or Read Aloud**

The proportion of utterances used by students to answer questions or read aloud did not differ significantly as a function of grade level. This category of communication acts, however, occurred the most frequently. An average of 55% of student utterances were used to answer questions or read aloud across grade levels. The percentage of occurrence demonstrates the control teachers have over classroom talk. When students do get an opportunity to talk in classrooms, it is typically in response to teacher questions or requests for information.

Teachers, on the other hand, spent an average of 2% of their utterances answering questions. This is in agreement with the limited number of utterances students used to ask questions in the classroom. As stated earlier, teacher responses to student questions were typically responses to
requests for clarification. It was also observed that when students were allowed to ask questions, the student was often required to wait to be solicited by the teacher in order to do so. An example is illustrated in this fifth grade sample:

Teacher: You've got a question, Justin?
Student: Ballroom?
Teacher: Ok, ballroom workers will be Rob because he has not worked.

This example also demonstrates elliptical responses used by students and the interpretation of those elliptical responses made by teachers.

**Free Responses and Performatives**

Free responses and performatives were deleted from final statistical analysis due to infrequent occurrence. Performatives probably occur infrequently across all types of discourse. Examples of performatives that did occur were "good morning" and "thank you." Infrequent occurrence of free responses demonstrates limited opportunity to engage in free conversation during formal classroom discussion. It also reinforces the need for children to learn a special set of rules for the classroom regarding when to talk and when not to talk (Lindfors, 1987). Analysis revealed that although not significant, third grade students used more free responses than either first or fifth grade. This finding relates to other trends that showed third grade
students using a greater number of words and utterances than either first or fifth grade students. The environment of the third grade classrooms appeared to be more conducive to all forms of discourse (formal and informal). An example of two third grade students' free responses occurred during a written language lesson. Students were volunteering their answers without solicitation as represented in the following statements:

Student 1: I put going

Student 2: That's what I did.

These free responses made by students illustrate what might be called the "underground curriculum" (Nelson, 1989). The "underground curriculum" involves students talking to students. The two students illustrated above are checking the correctness of their responses with each other. This type of language also demonstrates the limitations of audio-recordings of group instruction-discussion only, as much of student talking time may be found in the "underground curriculum."

Summary and Conclusions

In summary, this study examined the discourse of the classroom from a microanalytic perspective. A two-way factorial design was used to examine two independent variables which were: (1) grade level (1st, 3rd, and 5th) and, (2) speaker type (teachers and students). Multiple
dependent variables were grouped into two major parameters for analysis. These were characterized as: (1) language form and quantity variables, and (2) communication acts. Based on results of the MANOVA analyses, answers to the experimental questions that were posed in Chapter I can be presented as follows:

1. Evidence was found for speaker-type and grade level differences for the academic discourse variables studied.

2. Syntactic complexity was found to increase as a function of grade level for teachers (first and third grade were alike, fifth grade was different) but not for students.

3. The frequency of mazes in utterances by both teachers and students was found to increase with grade level.

4. The experimental hypothesis that the proportion of teacher talking time would exceed that of students was confirmed but, no significant differences were found by grade level. Teachers were found to produce approximately 80% of the words in instruction/discussion discourse at all three grade levels.

5. Differences in some of the communication acts produced at each grade level were also found. Results showed that: (a) teacher acknowledgements remained similar across grade levels, (b) teacher utterances used to convey content increased across grade levels; however, (c) teacher
utterances used to solicit information did not decrease significantly as a function of grade level. However, these additional changes occurred: (d) teacher utterances used to mark content increased across grade levels, and (e) teacher utterances used to solicit other decreased across grade levels.
Appendix A

Confirmation of Letter from HSIRB Stating Approval of Research Protocol
TO: Janet Sturm
FROM: Ellen Page-Robin, Chair
RE: Research Protocol
DATE: January 30, 1989

This letter will serve as confirmation that your research protocol
"Teacher and Student Discourse Variables in Academic Communication"
is now complete and has been signed off by the HSIRB.

If you have any questions, please contact me at 387-2647.
Appendix B

Subjects' Consent/Assent Forms for Participation in the Study
April 5, 1989

Dear parents and students:

During the school year we will be engaging in some cooperative research with individuals from Western Michigan University. The projects do not involve any changes in classroom routine. Rather, the researchers are simply interested in observing and tape recording what goes on during regular classroom activities. If you have any questions, please call the school office.

Sincerely,

____________________, Principal
____________________ Elementary School
Dear ______________________

We are conducting a study of classroom discourse used by teachers and students during academic activities. We would appreciate your assistance in helping us to conduct this study of regular classroom interactions by allowing us to place a tape recorder in your classroom for three days. All you will need to do is switch the tape recorder on as you call your class to order to begin instruction in the morning and in the afternoon. You will be given a high quality tape recorder to use, and a 90 minute tape that you will let just run until it runs out. In the afternoon, you will turn the tape over and start the recorder again. We would like you to do this for two consecutive days. At your discretion, you may switch off the recorder to deal with any incidents in your classroom that you feel should not be recorded.

We are interested in studying aspects of oral instructions in the classroom. The tapes we gather will be transcribed and analyzed. They will be used for descriptive purposes only--to learn more about how normal interactions occur in general education classrooms. The tapes or transcriptions will not be used to evaluate your teaching. They will not be shared with anyone as whole transcripts. However, sample interactions may be drawn out and quoted for illustrative purposes.

If you give permission for your classroom to participate, you may withdraw your permission at any time. You will not be penalized in any way if you decide not to participate. If any of the parents of children in your classroom indicate concern about this kind of research being conducted, we will not be able to use your room.
If you do agree to participate, we would appreciate your signing the attached consent form and returning it. Thank you for considering this request.

Sincerely,

Nickola W. Nelson, Ph.D. 
Trevor 
Associate Professor

Janet M. Sturm  
Kathryn 
Graduate Student Researchers
I have read the letter describing this study. I give my consent to participate in this study of classroom discourse. I understand that I can withdraw my permission at any time.

____________________________
Signature

___________________________
date
Appendix C

Description of School Districts
## Description of School Districts

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Appendix D

Teacher Information and Status
## Teacher Information and Status

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Appendix E

Taping Instructions
Conduct classroom activities on a normal schedule as we will be studying regular classroom interactions. Planning special activities which would involve an extra amount of talking is not necessary.

Please switch the tape recorder on as you call your class to order. Side A will be used for taping the morning session and side B for the afternoon. In the afternoon, you will turn the tape over and start the recorder again. We would like you to do this for three consecutive days. Please write the day of the week on tape 1, 2, and 3 as you use them. At your discretion, you may switch off the recorder to deal with any incidents in your classroom that you do not feel should be recorded.

We will be supplying your classroom with the three cassette tapes you will need in advance. If you have any additional questions please contact Dr. Nelson at (616) 387-8058. Thanks again for your participation.
TO START THE RECORDER, PUSH PLAY AND RECORD SIMULTANEOUSLY.

Attention: All of the knobs and switches are preset. If any should become changed inadvertently, this list will tell you how they should be set.

Left Panel

EXT. SPK. - OFF
TAPE SELECTOR - NORM (FAR LEFT)

Front Panel

LEVEL - 5
TONE - FLAT
MONITOR - TAPE (OUT)
PITCH - 0
SPEED - STANDARD
REC MODE - ALC (FAR RIGHT)
REC LEVEL - 6

Right Panel

MIC ATT. - 0dB (TOP SELECTION)
A.N.C. - TOP SELECTION
INPUT SELECTOR - MIC/TEL (MIDDLE SELECTION)
Appendix F

Teacher Questionnaire
TEACHER PARTICIPANT QUESTIONNAIRE

NAME________________________DATE________

SCHOOL________________________AGE________

IS ENGLISH YOUR FIRST LANGUAGE?_______________________

HOW MANY YEARS HAVE YOU BEEN TEACHING?_____________

HOW MANY YEARS HAVE YOU BEEN TEACHING YOUR CURRENT GRADE LEVEL?

______________________________________________

HAVE YOU TAUGHT OTHER GRADE LEVELS? IF YES, WHICH GRADES AND FOR WHAT PERIOD OF TIME?_____________________

______________________________________________

HOW LONG HAVE YOU LIVED IN SOUTHWEST MICHIGAN?_____

______________________________________________

HAVE YOU LIVED ELSEWHERE? IF YES, WHERE AND FOR WHAT PERIOD OF TIME?_______________________________________

______________________________________________

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Appendix G

29 Dependent Variables Used for Coding Transcripts
### 29 Dependent Variables Used for Coding of Transcripts

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<th>Quantity &amp; Complexity</th>
<th>Inform (CA)</th>
<th>Solicit (SO)</th>
<th>Acknowledge (AE)</th>
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</table>
Appendix H

Sample Transcripts of First, Third, and Fifth Grades
STUDENT, TEACHER, GROUP
+ M2T3
+ MARS ELEMENTARY
+ FIRST GRADE
+ TEACHER/FEMALE
+ SIDE A

1 T FOR OUR ORAL LANGUAGE THIS MORNING [MC]>
2 T EYE/S RIGHT UP FRONT LONNIE [SA][SO].
3 T KEVIN SIT UP STRAIGHT [SO][SA].
4 T THANK YOU [P].
5 T OUR FIRST SENTENCE SAY/3S "THE BOY/S SEE/3S A CAR, A BIRD, AND
6 A TREE" [MC][CC].
7 T "THE BOY/S SEE/3S A CAR, A BIRD, AND A TREE" [RC].
8 T WHAT DO WE NEED TO DO TO FIX THIS SENTENCE [SI]?
9 T DOUG [SO].
10 S "IT SHOULD BE THE BOY/S SEE A CAR, A BIRD, AND A TREE" [SSI].
11 T GOOD, "THE BOY/S SEE A CAR, A BIRD AND A TREE" [AE+][AR+].
12 T WHAT ELSE DO WE NEED TO DO [SI]?
13 T CHUCK [SO].
14 S THE "T" IN "THE" HAS TO BE CAPITAL BECAUSE EVERY FIRST LETTER IN
15 A SENTENCE HAS TO BE A CAPITAL [SSI].
16 T GOOD, "THE BOY/S SEE A CAR, A BIRD AND A TREE" [AE+][CC].
17 T WHAT ELSE DO WE NEED TO DO TO FIX THIS [SI]?
18 T JENNIFER [SO].
19 S (UM) WHEN A X LIST/ED MORE THAN TWO THING/S (UM) YOU NEED TO PUT
20 COMMA/S [SSI].
21 T VERY GOOD [AE+].
22 T WE/RE LIST/ING MORE THAN TWO THING/S SO WE NEED TO PUT COMMA/S
23 BETWEEN THE THING/S THAT WERE LIST/ED [AR+].
24 T JENNY, (WHAT) WHERE ARE THE COMMA/S GO/ING TO GO [SO][SI]?
25 T AFTER WHAT WORD/S [MC][RSI]?
26 S CAR [SSI].
27 T AFTER CAR [AR+].
28 T AND X WHAT ELSE [SI]?
29 S AND TREE [SSI].
30 T TREE AT THE END OF A SENTENCE [SI][AM]? 
31 T "THE BOY/S SEE A CAR, A BIRD, AND A TREE" [CC].
32 S BIRD [SSI].
33 T AND A COMMA AFTER BIRD, GOOD [AR+][AE+].
34 T "THE BOY/S SEE A CAR, A BIRD, AND A TREE" [CC].
35 T WHAT ELSE JEFFERY [SI][SO].
36 S A PERIOD AT THE END [SSI].
37 T A PERIOD AT THE END, GOOD [AR+][AE+].
38 T I WANT YOU TO THINK [MC][CA].
39 T LET/´S LOOK AT THE WORD BOY/S [SA][MC].
40 T "THE BOY/S SEE A CAR, A BIRD, AND A TREE" [CC].
41 T DO WE NEED AN APOSTROPHE IN THE WORD "BOY/S" [SI]?
S STUDENT, TEACHER, GROUP
+ SYLVESTER ELEMENTARY
+ 3RD GRADE
+ TEACHER/MALE
+ S2T3
+ SIDE A

+ T# 1 TRANSITION/TEACHER TALKING ABOUT LIBRARY BOOKS WITH INDIVIDUAL CHILDREN 02:07
+ T# 42 STUDENT SHARING/CLASS DISCUSSION 00:54

T OK, NOW BEFORE WE GET STARTED (NOW SOMEBODY DID/N'T WANT TO KNOW I WAS GONNA HAVE CONNIE) I'LL LET HER TELL TOMORROW OR THE NEXT DAY [MC][CP].
T CONNIE WENT SOMEWHERE LAST NIGHT [CC].
T TELL THEM WHERE YOU WENT CONNIE [SI][SO].
S ICE CAPADE/S [SSI].
T (AH) A LITTLE LOUDER NOBODY CAN HERE YOU [AM][RSI].
S ICE CAPADE/S [SSI].
T ANYBODY KNOW WHAT THAT IS [SI]?  
S <YEAH> [SSI].
S <ICE CAPADE/S> [R I].
S <OH OH> [FR].
T RIGHT [AE+].
S (THERE AND THE AH THEY WERE) IT WAS ON TV THAT IF YOU GO THERE YOU WOULD SEE THE CALIFORNIA RAISIN/S [SSI].
T <YEAH> (BUT WHAT DID HOW) WHAT DO THEY DO THERE [AM][SI]?
S <CUB SCOUT/S ARE GONNA GO> [SSI].
S THEY SKATE AROUND [SSI].
T OK, IT/’S ALL FAMOUS SKATER/S AND THEY PUT ON A SHOW ON SKATE/S [MC][ARE].
S MR XXX SOMETHING WENT WRONG WITH ONE OF THEIR PROGRAM/S SO THEY/’RE HAVE/ING A DIFFERENT ONE [SSI].
T OH REALLY [SI]?
S YEAH, I SAW (ON TV) ON TV THAT SOMETHING WENT WRONG WITH ONE OF THE (UM) XX [CC].
T BROCK TAKE THAT BACK FOR ME [SO][SA].
S WE/’RE GO/ING TO THE ICE CAPADE/S [FR][CC].
T HOW MANY OF YOU ARE GO/ING TO THE ICE CAPADE/S THIS YEAR [SI].
S [SEVERAL STUDENTS BEGIN TALKING AT ONCE] [SSI].
T I THINK IT/’S THIS WEEK [CC].

= 54 OF THE 360 NEEDED FOR SIDE A
+ T# 58 TRANSITION 00:45
+ T# 79 INSTRUCTION/DISCUSSION ABOUT NEWS 23:33

T OK, WHAT IS THIS THING [MC][SI]?
G NEWSPAPER [SEVERAL STUDENTS] [SSI].
T HOW MANY OF YOU GET ONE AT HOME [SI]?

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T CAN WE HAVE EVERYONE AT THEIR SEAT/S PLEASE [SA]?
T I'VE COLLECT/ED MOST OF THE STATE NOTEBOOK/S [CP].
T AND I HAVE THEM OVER ON MY DESK [CP][CC].
T AND I WILL BE GO/ING THROUGH THEM AND CHECK/ING THEM OFF (AH)
LOOK/ING FOR USE/ING THE OUTLINE YOU WROTE THEM WITH AND
CHECK/ING TO SEE HOW WELL THAT YOU FOLLOW/ED THE OUTLINE [CP].
T THE THING/S THAT I WILL BE CHECK/ING FOR WILL BE DO YOU HAVE ALL
THE PART/S OF THE REPORT IN YOUR REPORT [CP]?
T THE PART/S THAT WERE ON THE OUTLINE [RP].
T AND THERE WAS TO BE A SECTION ABOUT GEOGRAPHY, ONE ABOUT CLIMATE
ANOTHER ONE ABOUT NATURAL RESOURCE/S, ANOTHER ONE CONCERNING
INDUSTRY, HISTORY, TOURIST INFORMATION, OTHER INFORMATION, THEN
YOUR ILLUSTRATION/S AND YOUR MAP [CC].
T AND I WILL BE GO/ING THROUGH IF YOU HAVE ALL OF THOSE PART/S
[CP].
T YOUR XXX SAY/ES THAT MOST REPORT/S WILL PROBABLY BE AN AVERAGE
OR ABOVE AVERAGE OR "B", "C" TYPE OF THING [CP].
T IF YOU HAVE REALLY GONE ALL OUT AND HAVE MAYBE (AH) INCLUDE/ED
EXTRA INFORMATION BEYOND WHAT WAS REQUIRE/D OR EXTRA PICTURE/S
AS SOME OF THEM HAVE THAT I HAVE LOOK/ED AT [CA][CP].
T THEY DO HAVE UM) WELL THEY HAVE DONE RESEARCH [CP].
T I EVEN FOUND SOME PHOTOGRAPH/S IN SOME WHERE PEOPLE HAD VISIT/ED
THAT PARTICULAR STATE OR MATERIAL THAT THEY HAD SENT AND PAID
FOR [CP].
T THEY HAVE ALL THOSE KIND/S OF THING/S [CP].
T THAT WILL MAKE AN EXTRA PLUS ON THAT PARTICULAR GRADE [CA][CP].
T (AH) ALSO, YOU NEED TO HAVE A TITLE PAGE AND A LAST PAGE [CP].
T (AH) AND ON THE LAST PAGE YOU WILL HAVE TO HAVE THE BIBLIOGRAPHY
AND THEN YOUR TABLE OF CONTENT/S AT THE BEGIN/ING OF (THE) THE
REPORT [CP].
T ALL OF THE THOSE THINGS IN, WILL ENTER IN, INTO THE GRADE OF
THIS PARTICULAR REPORT [CP].
T ANOTHER THING THAT WILL PLAY A PART WILL BE THE COVER [CP].
T DID YOU TAKE SOME TIME TO PUT A COVER ON (THE) THE REPORT [SI]?
T DID YOU, YOU KNOW, JUST PUT A COVER ON AND NOT PUT EVEN THE TITL
ON [SI][CA]?
T (OR DID YOU) THERE WERE SOME THAT HAVE AN ATTRACTIVE COVER ON
THEM [SI][CA]?
T LET ME JUST SHOW YOU A FEW OF THEM [CP].
T ALRIGHT, HERE' S ONE [MC].
T I DO/N'T KNOW WHO DID TENESSEE [CC].
T BUT YOU CAN SEE THEY HAVE THE STATE FLAG AND THE WORD "TENESSEE"
[CC].
T WHO DID TENESSEE [SI]?
Appendix I

Subjects' Raw Scores for All Dependent Variables
<table>
<thead>
<tr>
<th>Group</th>
<th>Total Utterances (TOT UTL)</th>
<th>Total Words (TOT WDS)</th>
<th>MLU</th>
<th>Prop. Words (PROP WDS)</th>
<th>Types of Words (TYPES WDS)</th>
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