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DEDICATION

To my father, who didn't have the opportunity for higher education, but wanted it for his children.
PREFACE

The research in this dissertation was supported as part of a contract from the United States Office of Education, Division of Follow Through, to The University of Arizona, Arizona Center For Educational Research and Development, for implementation and evaluation of the Tucson Early Education Model. The opinions expressed do not necessarily reflect the official policy or positions of the United States Office of Education, and official endorsement should not be inferred.
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ABSTRACT

The purpose of this study was to determine the effects of two different school language programs at the end of third grade, Follow Through (FT) and Non Follow Through (NFT), on the development of children's oral and written language on measures of complexity of structure and diversity of meaning. Linguistic complexity was studied by use of the T-unit and percentage of complex T-unit measures, while linguistic complexity was examined through use of the type-token ratio. The two language programs studied were FT, the Tucson Early Education Model (TEEM), an innovative language experience program, and NFT, a traditional approach.

Subjects used for the study were 70 children continuously enrolled in FT (n = 34) and NFT (n = 36) classrooms since kindergarten or first grade, allowing for examination of program effects at the end of the third grade. One oral and two written language samples were obtained for each of the 70 subjects. Collection of the language took place within the classroom context, emphasizing sampling of children's natural language abilities. Instruments used for the collection, coding, and scoring of oral and written variables were the Children's Language Assessment-Situational Tasks (CLA-ST), developed by TEEM at the University of Arizona, and the Productive Language Assessment Tasks (PLAT), developed at the High Scope Education Research Foundation in Ypsilanti, Michigan.
Using a posttest only control group design, two separate analysis procedures were performed. A two-way analysis of variance with repeated measures was used to determine the program impact on the linguistic complexity and diversity measures in the oral and written language of FT and NFT children. A correlational analysis was also performed to determine the relationship between the oral and written language patterns for both the control and experimental groups.

Study results indicated no significant differences between the two groups, FT and NFT, on the measures of linguistic complexity, T-units, and percentage of T-units. On the type-token ratio measure, the differences between the FT and NFT groups were not significant, but greater differences were shown than between the two groups on the complexity measures. When examining the mean scores for the type-token ratio, the FT children consistently scored higher. These differences indicate a trend toward higher scores on this measure for the FT group even though the differences were not significant.

Significant differences were found, however, between oral and written language for the subjects of both groups. Correlational procedures used to examine the relationship between oral and written language resulted in low to insignificant relationships. This is consistent with the analysis of variance finding of significant differences between oral and written language. Linguistic measures in oral language were found to be relatively independent of the same measures in written language. Competencies in oral language did not predict competence in use of written language for this age and group
of children. Results indicate that children at this age are aware of the different functions and use of oral and written language. Trends found favoring the FT group indicate possible program effects. Further longitudinal investigations of the complexities and interrelationships of children's developing productive language abilities within the context of different classroom language programs are recommended.
CHAPTER ONE

INTRODUCTION

Research on children's language has increased rapidly in the past several years. Consequently, the complexities of language acquisition are beginning to be more clearly understood. "We now know how language can be crucial to learning and how the knowledge, information, and experience which the child meets in school need to be gone over in his own language if they are to be understood" (School Council Writing Across the Curriculum Project 1973, p. 1). Language also becomes a tool of thought and gives children a system for organizing and understanding their experiences. Learning is not just words or experiences but the constant interplay of related experiences and language toward knowing. What children know and experience determines what they understand (Smith 1975).

Teachers must be aware of the interrelatedness of the language processes in order to integrate communication skills into all aspects of classroom learning (Osburn & McDonell 1978). The attainment of language includes the receptive processes of listening and reading and the productive processes of speaking and writing. Spoken language provides a foundation on which children build reading and writing skills. Children use speaking and writing as means of expression through which they develop their ideas and feelings. Additional
information is needed about the development and refinement of children's productive language skills within the classroom context.

Despite the central role language plays in the development of children's intellectual and social skills, schools have traditionally emphasized development of the receptive language processes of listening and reading over the productive language processes of speaking and writing. Language research has often focused on one language process at a time, generally in isolation from the classroom environment. Linguistic research has concentrated on describing the linguistic system that lies behind language use, rather than describing the differences between speech and writing (Halliday 1980). More information, therefore, is needed on children's development of language skills in varying educational settings in order to gain an understanding of the differential effectiveness of a wide variety of teaching approaches. The effects of different language programs on children's development of language skills are likely to have profound implications for educational practitioners.

**Statement of Problem**

The purpose of this study was to determine experimental program impact on third grade children's oral and written language as measured by linguistic complexity of structure and diversity of meaning. More specifically, the focus of the study was to examine what effects different school language programs, Follow Through (FT) and Non Follow Through (NFT), had on the development of children's productive language skills.
This study primarily sought answers to the following questions:

1. What similarities and differences exist between children's oral and written language?

2. What differences exist between measures of complexity of sentence structure and diversity of meaning in third grade children's oral and written language?

3. What differences exist between the spoken and written language of children schooled in educational programs with different philosophical orientations towards language learning?

4. What differences exist between oral and written language when compared to the differences in language usage between children schooled in different educational programs?

Hypotheses

The following null hypotheses were tested at the .05 level of significance:

1. There is no significant difference between FT and NFT children on measures of linguistic complexity and diversity.

2. There is no significant difference between oral language and written language as measured by linguistic complexity and diversity.

3. There is no significant interaction between FT and NFT on measures of linguistic complexity and diversity of oral and written language.

4. There is no relationship between oral and written language on measures of linguistic complexity and diversity for the subjects exposed to two different kinds of educational programs.
5. There is no difference between the correlation coefficients of written and spoken language obtained for the FT and NFT subjects.

**Significance of Problem**

Identification and description of differences between measures of language structure and meaning, oral and written language, and program effects on language are important to the research on children's language development for several reasons. First of all, much of child language research has dealt with acquisition of linguistic structure. Only a few studies have investigated development of meaning, and even less is known about the relationship of surface structure to deep structure in children's language usage. Additionally, language research has focused on either oral or written language while ignoring the examination of similarities or differences of the two. This study sought to describe the differences between third grade children's oral and written language on linguistic measures of complexity and diversity.

Currently there exists a philosophical argument among language educators on the role of oral language in the development of children's writing skills. The information gained from this study should contribute to the description of differences of children's oral and written language within the context of two philosophically different language development programs. In the wake of an increasing interest in examining the relationship between spoken and written language, the description of the differences in language usage by children exposed to various pedagogical language programs may provide some clues to their comparative effects on language learning. Interaction
effects between the linguistic measures, oral and written language, and type of program may lead to a series of recommendations for further investigation. Conclusions emerging from this study should enhance the theoretical knowledge about language and suggest implications for educational practices in the teaching of language.

Definition of Terms

1. **Language**—"Language is human thought, either produced or perceived. Language is a universal code system used to communicate ideas to others in personal interaction and across time and space through reading and writing" (Lee & Rubin 1979, p. 5).

2. **Speaking**—Talking is the oral expression of selected portions of a person's thoughts. Spoken language or oral communication involves the developing of competence and skill in using language to express thoughts and feelings. Speech is also affected by the functions or purposes for which children use language (Halliday 1973).

3. **Writing**—Writing is recording ideas, thoughts, and feelings on paper using symbols or printed words. Writing cannot exist apart from thinking, speaking, listening, and reading. It is a means of transmitting and retrieving ideas, knowledge, and information across time and space, and across cultures and languages. Children can deal with objects, events, and knowledge outside their immediate perception and
also clarify their experiences and the meaning of those experiences through writing (Lee & Rubin 1979).

4. **Linguistic Complexity**—Linguistic complexity is a measure of syntactic performance which denotes the number and type of sentence structures, simple or complex, used in children's spoken and written language.

5. **Linguistic Diversity**—Linguistic diversity is a measure of the number of content words spoken or written by children which gives an indication of a child's vocabulary size and concept development.

6. **T-unit**—A "minimal terminable unit" (Hunt 1965, p. 21), or T-unit, is the simplest part of a sentence that can stand alone—a single main clause.

7. **Percentage of Complex T-units**—A complex T-unit includes a single main clause and all subordinate clauses. After a frequency of T-units within a text is determined, the number of complex T-units is calculated. The percentage of complex T-units is computed by dividing the number of complex T-units by the number of simple T-units.

8. **Type-token Ratio**—The type-token ratio is a measure of vocabulary size and is determined by counting the number of different words (types) within a text and dividing the results by the total number of words (token).
CHAPTER TWO

REVIEW OF THE LITERATURE

The study of language has intrigued man since the beginnings of time. In the past two decades, research on language acquisition, processing, and its role in intellectual development has highlighted the complexities of language learning. Allen (1976) has pointed out that language learning is related to the thought processes, and the language and thought of children are inseparable. The questions current researchers are attempting to answer deal with the interrelationships of children's language development processes with thinking and learning, and the effects of different theoretically based classroom programs on the development of children's language skills. This section, therefore, presents research findings related to the purposes of the study. Theoretical conceptions of language and their educational application to language acquisition are also examined. Finally, the review of literature dealing with the relationship between spoken and written language is summarized.

Theoretical Conceptions of Language and Their Educational Application

Until the mid to late nineteenth century, the study of language and its meaning was relegated to the realm of philosophy. An increased emphasis on scientific methodology led to the development of descriptive or structural linguistics and to child language as fields of study (Bar-Adon 1971).
From this early research there emerged major changes in the way language learning was viewed. Children were no longer viewed as imperfect imitators of adult language; sets of language patterns or rules were formulated to describe languages; emphasis was placed on oral rather than written language; and universal characteristics of language were identified (Dale 1976).

The development of transformational-generative grammar in the late fifties and early sixties radically altered the field of linguistics and the study of child language. Consequently, a distinction was made between linguistic competence and linguistic performance; the concept of surface and deep structure was developed; the functions or uses of language were analyzed; the importance of studying language in context was emphasized; and two basic categories of words were identified, form class or meaning words and function or structure words (Chomsky 1968). In exploring ways to apply knowledge gained from transformational grammar to the teaching of language, Rosenbaum states that in providing a general account of linguistic structure, a transformational approach to linguistic inquiry provides new insights into intellectual capacity. Specifically, he refers to the properties of the human mind which facilitate language acquisition. He explains that in pursuing this capacity through linguistic mechanisms which underlie language competence, the student is involved in study "which has had intrinsic intellectual appeal for centuries, the study of those abilities which make human beings human" (Rosenbaum 1972, p. 5).
In the past two decades contributions to the field of knowledge dealing with children's language and cognitive development have been made by individuals in various disciplines. Linguists have recorded and described features of language such as the phonological system and use of syntactical patterns, and have documented the stages children go through as they acquire language. Psychologists have considered the cognitive processes used by children as they learn language and interact with their environment. Educators have used this linguistic and cognitive knowledge to develop theories or rationales on which they base their applied education practices (Allen 1976). In order to talk about conceptions of language and application of theoretical models to language research and classroom instruction, it is necessary to review the three predominant language acquisition and development theories, the nativistic, the behavioristic, and cognitive-field theory.

The nativistic theory of language development, whose best known proponent is linguist Noam Chomsky, holds that children possess innate language mechanisms that are responsible for most of how and what they learn about language. Essentially it is an intuitionist theory, suggesting that children have an inborn or intuitive predisposition for language (Chomsky 1968). The behaviorist theory suggests that language is learned primarily through imitation and that children's speech is shaped by their language environments. B. F. Skinner (1957) is the main supporter of this theory, which opposes the innate view by claiming that everything is learned through external stimuli. Cognitive-field theory stresses the child's own
active role in acquiring language. "Thinking is an ongoing process of
the mind. The content of thinking is made up of each person's per-
ceptions, interactions, and feelings about the experiences he has in
the world. Thinking determines communication...without thought there
could be no meaningful communication" (Lee & Rubin 1979, p. 32). The
best known proponents of this view are developmental psychologist
Jean Piaget, linguist Lev Vygotsky, and psychologist Jerome Bruner.

Nativistic Theory

The nativistic, or genetic, theory is best reviewed by
examining the work of Chomsky (1966), who believes that each child
discovers individually how language works. He proposes what he calls
"linguistic universals," which are in the broadest sense the basic
meanings people express and the commonalities of all languages. He
believes that language is innate, that humans are instinctively able
to develop and use symbolic language.

To the nativist, the task of understanding how language is
acquired consists initially of writing a grammar that includes formal
and substantive universals. The grammar is not a description of the
performance of the speaker, but rather of his linguistic competence,
performance and competence being two distinct things. Chomsky (1966)
doubts whether the insights about language theory obtained in lin-
guistics and psychology can be directly applied to language teaching.
However, he discusses four notions that may be significant for language
teaching: creativity in language use; the abstractness of linguistic
expression; the universality of underlying linguistic structure; and the role of intrinsic organization in cognitive processes.

Chomsky's views of learning as they relate to language acquisition and role of instruction can be summarized as follows: language capacity is genetically determined and realized by the individual's innate language schemata; this capacity includes the ability to select from this schemata the relevant phonological features the utterance requires; learning involves building on already acquired knowledge of language; reinforcement is not significant for language acquisition, although it may facilitate knowing better how to use the innate language structure by creating an awareness of the same; and transfer of learning implies using rule learning from the innate language structure in a variety of situations.

In relationship to speaking and writing, Chomsky would advocate school experiences that allow students to explore and discover language processes. Since language learning is intuitive, and not directly taught, the oral language process transfers to symbolic language use as children write and discover rules for writing. Speaking and writing are learned by talking and writing, and are highly individualistic.

Behavioristic Theory

Skinner, a behavioral psychologist, advocates and speaks for imitation-reinforcement theory. This theory proposes that children learn language by imitating the speech of those around them. They continue to use the language that people react to in a positive way. Skinner's description of verbal behavior is behavior reinforced
through the mediation of other persons, and as such it cannot be dis-
tinguished from behavior in general (Skinner 1957). An account of the
behaviors of the speaker and listener taken together makes up a total
verbal episode. One interpretation of this interaction allows a causal
analysis in which specific verbal behavior can be predicted and con-
trolled by changing the conditions under which it occurs. This
approach to verbal behavior satisfies the need for a science of verbal
behavior that can be applied whenever language is used (Skinner 1957).

Skinner's hypothesis on language acquisition accepts two types
of determiners, genetic and learned. These work together in a comple-
mentary and not antagonistic way (McCorquodale 1970). However, what
is genetic may be observable only as a disposition toward language,
as what is learned is observable in every behavior. Language teaching
must inevitably concern itself with behaviors that show increased
learning and with ways to encourage these behaviors. Regarding
instruction, models of prescribed language, such as patterned drills,
can be used to produce new verbal behavior (McCorquodale 1970).

Skinner's point of view on learning as it relates to language
acquisition and the teaching process is summarized as follows:
capacity for language depends on the structuring of the stimuli in the
teaching environment; learning takes place when an individual responds
to stimuli in the environment; reinforcement strengthens response
probability; transfer occurs when there are common elements either in
a response already reinforced or in a reinforcer that has already
proved to be reinforcing; goals in a Skinnerian classroom are
behavioral objectives that facilitate the learning process, such as practice in transfer, discrimination, etc.; and measurement consists of tests or observations to assure that specific behaviors can be accomplished.

In relation to speaking and writing, school experiences would emphasize student language behaviors based upon teacher-selected models. These models would be incorporated into each student's repertoire. A precise and exact use of language would be advocated. The teacher's role would include structuring of appropriate stimuli in the teaching environment. Teachers would use reinforcement to strengthen correct response probability. Measurement of learning would be conducted through tests and observations to assure specific behaviors are mastered.

Cognitive-Field Theory

Cognitive-field theory takes an interactionist position. Language is viewed in relation to cognitive psychology, which holds that the internal function of language facilitates the individual to create order from the environment into existing patterns. This approach finds that language use owes more to the imaginative faculty of the mind than to the logical. We create order linguistically out of experiences and "simply by its selective nature, language reduces the vast and awesome overabundance of life" (Miller 1972, p. 2). Language also serves an external function by allowing one to reach out and communicate with the world for testing and validating discoveries.
Some of the most influential work in cognitive development involving children has been that conducted by Piaget. His early work dealt with language in relation to thought, and was published originally in 1926 (Piaget 1955). More recently, he reported new understandings based on his interim research. Initially he rarely looked at anything other than verbal thought. But with his studies of sensorimotor intelligence he recognized the existence of a logic of coordinations of actions that are "far deeper than the logic related to language and much prior to that of propositions in the strict sense" (Piaget 1973, pp. 109-110). While Piaget recognizes a close relationship between thought and language, his later studies pinpointed a crucial issue. When considering levels of children's intellectual development, he found that children can and do operate on a level above that on which they use language. Another relevant finding in Piaget's early research was that until about the age of seven, children think largely egocentrically. They converse, sharing ideas, but each is mainly talking about his own actions and thoughts. Piaget felt that logical thinking is primarily non-linguistic, is derived from action, and that language makes its appearance when actions begin to be represented in thought and becomes clear only as ideas become more logical (Sinclair-de-Zwart 1969).

Piaget believed intelligence develops in a series of four stages which follow in sequence: sensorimotor stage, from infancy to two years of age, preparation for some of the phonetic phases of language is found in early schemes of hearing, voicing, of reciprocal
eye, ear, voice and movement coordination and time sequencing (Furth 1969). The second stage is characterized by the formation of the symbolic or semiotic function, which includes use of representational thought and acquisition of language. Language, as a special symbol system, plays an important role in communicating and socialization during the concrete operations stage beginning at about the age of seven. The formal operations stage begins around the age of twelve, when thought becomes flexible and children can deal with complex problems of reasoning through verbal communication (Piaget 1966).

Piaget (1964) attributes the transition from one stage to the next to four factors: maturation, increasing differentiation of the nervous system; the child’s experience in the physical world; social transmission or interaction with people in a learning-teaching relationship; and equilibration, bringing into balance the world and the child's view of it. Language is only a factor in cognitive development and is only a part of symbolic functioning. Piaget (1966) did not assign an important role to the use of a representational system, except in formal operations. Then, the ability to use language to encode abstract ideas facilitates the utilization of formal operational structures. It is important for teachers to work with children at their developmental levels.

Vygotsky's contributions to the understanding of children's language and thought development are complementary to those of Piaget, but his views on the role of language in intellectual development differ significantly. From a Piagetian perspective, language is a
principal factor in some types of learning and not a factor in others. Vygotsky (1962), however, contends that language is a mediating factor in all learning. The first perspective emphasizes language learning in and of itself, as one type of learning among others, while the second considers language as a guiding factor in every kind of learning. In contrast to Piaget's emphasis upon language as an outside agent in the child's developing thought, Vygotsky's position emphasizes the language of the children and the adult teacher in the creation of thought (Smith, Goodman & Meredith 1976).

Vygotsky's work greatly influenced Bruner, whose views on language and thought development speak to the important role of language in learning. Bruner's studies of thought and representation in childhood contribute to an investigation of structure and meaning in language. His theoretical emphasis has been upon the construction of internal models which he calls generic coding systems. Bruner (1973) believes that in learning a language one learns a coding system that goes beyond words by being able to place the present in a generic coding system.

Representation is a key theoretical concept in Bruner's view of language and cognitive growth (Bruner 1973). Representation is "the system of rules by means of which an individual conserves in a manageable way the recurrent features of his environment" (Bruner 1973, p. 311), or the way the mind re-presents reality to itself in thinking. There are three systems of representation: the enactive, the iconic, and the symbolic--knowing something through doing it, through a
picture or an image of it, and through some symbolic means such as lan-
guage (Bruner, Olver & Greenfield 1965; Bruner 1973; Dale 1976).

Bruner sees the development of language and thinking as a
successive mastering of these three forms of representation. Enactive
representation occurs in the first two years of life and is expressed
in the medium of action. By the end of his first year of life, the
child is able to represent the world to himself by an image or spatial
schema that is relatively free of action. These iconic or perceptual
representations are static and the elements of the image cannot be
rearranged or combined (Dale 1976). The transition from iconic to
symbolic representation occurs when there is a conflict between the
iconic mode and the child's emerging use of the linguistic mode.
Gradually, the child comes to rely on symbolic encoding, not direct
perception. Once the child has succeeded in internalizing language as
a cognitive instrument, it becomes possible for him to "represent and
systematically transform the regularities of experience with far
greater flexibility and power than before" (Bruner 1973, p. 330).

In studies discussed by Bruner (1973), schooling is the variable
that makes qualitative differences in the directions of growth. The
semantic and syntactic components of language become necessary when
one has to communicate out of the context of immediate reference.
This is also the way written language differs from spoken. School,
then, provides an opportunity to use language out of context, talking
about things that are not immediately present. Bruner sees represen-
tation as playing a critical role in the cognitive development of the
child. He feels that linguistic transformations help guide the thought processes when the child first uses symbolic representation. The culture and specific language of the child also determine and to a certain extent control the development of a child's conceptual structures.

Competence and Performance Models

Models for research on language and development of classroom language programs can be derived from the theoretical positions described earlier. In most instances the nativist interpretation of language and information processing has been related to the competence model, while the empiricist point of view has been tied to the performance model. Linguistic competence is the implicit knowledge that each speaker has of his or her natural language (Chomsky 1965). Linguistic performance is the actual language used by a speaker of a language. Competence, then, is the possession of a capacity for language (Bronson 1973), while performance is the translation of a person's knowledge of the language into action (Dale 1976).

Language research using competence models of analysis has attempted to determine a person's total knowledge of the native language by characterizing the linguistic rules or categories that determine language knowledge (Chomsky 1965; McNeill 1966). Language research performance models have examined the communication of ideas by studying the behaviors of listening and speaking in the real world, given physical, cognitive, and situational factors (Quinllian 1968; Schank 1970). Both models raise similar questions about how humans acquire language, but have often come to very different conclusions.
Over the years the debate has developed and researchers have become increasingly more involved in the task of explaining language learning. These theoretical explanations lead educators to different classroom approaches. The performance model or the less-language viewpoint stresses the developmental deficiencies, and the educational goal is to narrow the gap between what the child has and what he needs. The competence model or different language viewpoint generates an educational goal of the development of a linguistic system in addition to the one the child already possesses. The educating process builds on what the student brings to the learning setting. And the latter position on language development stresses the active role of the learner in using language as a functional tool both in the cognitive and affective domain.

During the 1960's a large national education effort was begun to seek answers as to what types of educational programs were most effective with different children. It began with the Head Start preschool program, and in 1967 "Project Follow Through was established by Congress in an effort to provide a compensatory education program which would be continuous from preschool through third grade....A clearly stated purpose of the Follow Through program is to enhance the life chances of the economically deprived child" (Stalling 1978, p. 1). As early childhood programs developed, many based their program design on the belief that low-income children were deficient in learning and language. The deficit view of children and their language became the theory behind most intervention programs that developed.
Language performance model programs are set up by instructional objectives arranged in a sequential hierarchy which children are to master step by step. The basic teaching method is that of direct instruction, often with pattern drills in language and other subjects. There is an emphasis on the cognitive, academic uses of language rather than the social, functional use of language. In developing speaking and writing skills, the role of stimuli and correct responses would be stressed. Teachers use reinforcement and behavior modification techniques to shape children's appropriate verbal behavior. Tests are used to measure learning or mastery of specific behaviors. Subjects are taught at prescribed times. The traditional Non Follow Through program used in this study is based on such a view of language learning.

Tucson Early Education Model

One theoretically based program which developed in response to competence model research findings on the nature of the teaching-learning and language processes was the Tucson Early Education Model of the University of Arizona. Under the leadership of Marie Hughes, the Tucson program began in 1965 as a cooperative project between the University of Arizona's College of Education and the Tucson, Arizona, Public Schools to improve the educational program for Mexican-American children. In 1967 the Tucson Early Education Model became a model sponsor for the United States Office of Education's Follow Through Program.
The educational goals and objectives of the Tucson Early Education Model are based on a difference rather than a deficit view of language and learning. Developed within the interactionist or cognitive-field theoretical framework, the Tucson program "required change not only in curriculum, but in teaching methods and classroom organization as well" (Silberman 1970, p. 311). If children from low-income families are to succeed, Silberman explains that Marie Hughes felt that school experiences must help children develop a positive attitude toward themselves as well as viewing themselves as worthy and capable of dealing with one's world. These two notions provide a basis on which program objectives can be built. Those objectives include:

1) developing a positive attitude toward learning; 2) developing children's language ability with emphasis on talking freely and comfortably; 3) developing an intellectual base by learning how to learn, how to process information, how to solve problems, how to distinguish cause and effect, and how to classify and label; and 4) acquiring the skills of reading, writing, and arithmetic as well as the social skills valued in getting along with others (Silberman 1970).

The four objectives mentioned above became the goal areas of the Tucson Model, emphasizing children's development of: Competencies in the Language Base; an Intellectual Base; a Motivational Base; and the Societal Arts and Skills. Each of these goal areas is seen as equally important. (For a detailed description of the Tucson Early Education Model, see Appendix A.) The underlying belief of a difference rather than a deficit view of learning, of language development, and of
culture made the Tucson Early Education Model unique among the other Follow Through Model Sponsors. It was not until the end of the sixties that other Follow Through model sponsors changed their viewpoint on the language difference-deficit issue.

The Tucson Early Education Model has a language-centered approach to learning. Language development includes the interpersonal and functional roles of language as well as the cognitive. A language experience approach to developing communication skills relates new knowledge and experiences to what the child already knows as he develops listening, speaking, reading and writing skills. In developing speaking and writing skills, experiences are provided which allow and encourage students to explore language usage. The language-centered Follow Through program used in this study is the Tucson Early Education Model. Children's oral and written language usage were examined within the context of these classroom approaches.

**Relationship Between Spoken and Written Language**

Listening and reading are the language processes through which people receive or take in and react to thoughts, feelings, and ideas of others, either orally or through print. Speaking and writing are the language processes through which people produce or express meaning, their thoughts, feelings, and ideas, using language orally or in its written form (Goodman & Goodman 1976). A growing body of literature supports the interrelatedness of the language processes. Knowledge on how children learn language suggests the importance of an integrated approach to teaching communication skills (Lee & Rubin 1979).
Children's natural language learning abilities of listening and speaking can help them in learning to read and write. K. Goodman (1976) says language is learned from whole to part, and children become first aware of a whole message and then their relationship to specific messages. He also says that adults have imposed their logic and afterthought to language instruction by starting with the pieces and moving to the whole. "In taking language apart, divorcing it from meaning, we're starting with the most abstract and moving to the concrete. That's the opposite of how kids learn, particularly of how they learn language" (K. Goodman 1976, p. 4).

In order to compare oral and written language it has been necessary to search out relevant literature and research which deals specifically with the relationship between talking and writing. Much has been written in the past several decades on the development of oral language. Child language research has described the stages children go through as they acquire language. People with differing theoretical beliefs agree on the stages of language acquisition, but differ as to how and why each stage occurs. Language features that are accepted by the various positions include:

1. Language is present in every human society, and children learn to speak whatever language they hear around them (Hess & Croft 1972).

2. Children experiment with all sounds and easily acquire a complicated system of sounds of the language around them (Dale 1976).
3. Children begin to speak at approximately the same age and go through these stages: a) babbling begins at birth and ends around twelve months of age; b) early intentional speech consists of holophrastic utterances; c) telegraphic speech occurs next as children use noun and verb patterns; d) as utterances increase in length, they become syntactic and have more meaning, syntactic structuring becomes more evident; e) most children have adequate use of sentence structure by age three; f) and by four years of age, children use speech that approaches the adult level, communicating thoughts with adequate structure and meaning (Lee & Rubin 1979).

4. Comprehension of the language of others precedes the use of that language by the child (McCarthy 1971).

5. Most children learn to speak their native language without the need of formal instruction (Smith 1971).

How children acquire written language has not been studied as thoroughly as oral language acquisition, but in the past decade there has been increased interest and emphasis upon development of children's writing abilities. Some research on writing acquisition has looked primarily at handwriting, other observable behavior, and only the physical aspects of writing (Ajuriaguerra & Auzias 1975). Other research, primarily in college composition, deals with teaching adults who are literate to write (Faulk 1979), with assessing the quantity of writing produced, and with the testing of instructional materials (King & Rentel 1979). Spelling is also being studied, and children's invented spellings have developmental patterns that are based on
identifiable abstract principles which are logical and reflect competence in an underlying phonological system (Read 1975).

Recent studies of writing "challenge the traditional categories of rhetoric and propose new ways to classifying varieties of discourse" (King 1978, p. 194). People such as James Moffet, James Britton, Michael Halliday, Janet Emig, and Donald Graves have combined studies of both the external and internal responses to the writing process. Areas being studied include writer-audience, object-matter relationships, functions of writing. Moffet (1968) identifies time and space—the distance in time and space between the writer, receiver, and subject matter—as the critical factors in producing different types of writing. The concepts of participant and spectator roles are important in understanding Britton's (1970) three function of writing categories. They are the expressive, the poetic, and the transactional, which can be either informative or conative writing, and the relationship between what is written and what is done.

Halliday's (1973) interpersonal and ideational functions of spoken and written language seem to incorporate all aspects of language usage, but Halliday has defined a third function, text, as "instrumental to the other two....Text refers to an internally consistent body of writing or speech which is comprehensible without reference to something outside the piece itself. Text is a semantic unit encoded in sentences, written or spoken, that has meaning within itself and in relation to the context of which it is a part" (pp. 106-107). Emig (1980) believes that writers construct their reality through
imaginative sequences of experiences and activities, and she stresses the importance of looking at writing from a developmental viewpoint. Graves supports the importance of developing in children a natural interest in writing, as well as an ability to write (Graves 1978).

Only recently has there been interest in what the specific differences are between spoken and written language. Schools have traditionally emphasized the reading and writing processes, and there has been much discussion on their similarities and differences. Emphasis on the interrelatedness of all language processes is giving people new insights, but its importance is not new to proponents of use of a language experience approach to communication. Reciprocal relationships of oracy and literacy have been stressed. "Only as the child at all levels of the elementary school is encouraged to continue self-expression through the spoken word is there in the classroom raw material out of which refined written language evolves....Speaking and writing reinforce the reading program and reading of good writing enriches the speaking and writing programs" (Allen 1976, p. 39).

Spoken language and written language are both productive language processes and have often been viewed as parallel forms of language. Research in the area of psycholinguistics shows that speech and writing are closely related, but not at the superficial level of spelling. Increasing evidence discounts the conventional belief that written language is a visual representation of speech and that reading requires decoding text to sound (Smith 1975). Chomsky's (1966) distinction between the structural and the meaning properties of language
provides a useful conceptual framework with which to look at the differences between spoken and written language. Deep structure is defined as the "level of language at which meaning is interpreted--the 'semantic' level--and surface structure the level at which phonological or graphic representations are realized. The bridge between the two levels is 'grammar,' defined as the abstract set of syntactic rules used by an individual to generate or comprehend sentences in his language" (Smith 1975, p. 350). One concern in much of the language research is that it deals only with surface structure analysis. And it may represent a superficial view of language and its complexities.

Smith (1975) discusses two basic rules of oral language development. The first rule is that meaning always precedes grammar, or deep structure comes first. The second rule is that both semantic and grammatical development proceed from the simple to the complex. Halliday agrees with these rules, but goes beyond to talk again about the relationship between spoken and written language. He feels that one reason the differences of speech and writing have not been investigated in depth until recently is partly that linguists "have neglected the study of a fundamental aspect of language, that of discourse, or connected passages of language in actual use, whether spoken or written" (Halliday 1980, p. 7). Another difference Halliday (1980) sees is the fact that oral language or spoken text does not exist, it happens, and it is dependent on context for meaning. A written language text "must create its own context in which it can be understood" (Halliday 1980, p. 7). King (1975) also talks of the powerful
theoretical arguments for a view of language in which semantic constraints prevail in describing how sentences are formed. She continues explaining that most important for researchers of composition is the work of linguists who are considering not only problems associated with the role of meaning in a grammar, but also are beginning to explore semantic relations in text units larger than the sentence. This work focuses on how language transmits thoughts and ideas, and the problem of "how what people say is related to what they know" (King 1978, p. 196).

In helping young children make the conceptual leap which relates writing to speech, both Smith (1975) and Halliday (1980) feel that teachers and parents need to coordinate the new behavior with the ability to speak and listen which they already possess. The use of dictation, the idea of "talk written down," helps as a bridging device for learning to read and write (Allen 1976). "Writing from dictation and reading aloud are possible only via a loop through a deeper level of language at which meaning is represented, that is, making use of the reader's (or writer's) knowledge of grammar" (Smith 1975, p. 350). The ability to sustain a topic appears to predict a necessary representational prelude to writing ability, one which shows that children are abstracting and representing various levels of discourse structure as they move from speech to writing (King & Rentel 1979).

Few articles relate directly to the relationship of complexity of sentence structure and diversity of meaning in both oral and written language. However, Halliday (1980) discusses this relationship and
explains that while speech and writing can both be complex, their complexities tend to differ. The complexity of writing is crystalline—a denseness of matter. In linguistic terms, spoken language is characterized by complex sentence structure with low lexical density. This means more clauses, but fewer high content words per clause. However, written language is characterized by simple sentence structures with high lexical density, meaning more high content words per clause, but fewer clauses. "Speech has complex sentences with simple words, while writing has complex words in simple sentences" (Halliday 1980, p. 10).

The lexical density measure talked about by Halliday is used as a language-in-action register by linguists and is an affirmation of Malinowski's idea of "context of situation" (Ure 1970, p. 443). Lexical density is figured by counting all the words in a text and then counting all the words with lexical properties (i.e., meaning-bearing words or form class words). Then a percentage is arrived at which is the proportional occurrence of content words for each text. When written and spoken texts are compared on this measure, the results are striking; the spoken texts have a lexical density of under 40 percent and the written texts have a density of 40 percent and over (Ure 1970). This would correspond to Halliday's description of the differences between the structure and content of oral and written language.

Much research on children's language has been on syntactical development. Syntax is viewed as the linguistic feature which makes creativity in language possible (Griffin 1968). McCarthy (1954) stated that the most reliable, objective, quantifiable, and easily
understood measure of linguistic maturity is sentence length. However, the methodology of determining the boundaries of sentences has been less than consistent. Brown (1973) gives the rules for calculating mean length of utterance (MLU), which is used as an index of development for young children. Mean length utterances give an indication of quantity, but do not deal with a sentence's complexity.

One of the most comprehensive studies of oral language development in school-age children was done by Walter Loban (1963). His longitudinal study followed children for thirteen years, from kindergarten through sixth grade. One finding from his work was that maturity in language usage includes a greater variety of sentence structuring. Loban used a "communication unit" (1963, p. 6) "as a group of words which cannot be further divided without the loss of meaning." Hunt introduced the T-unit, or "minimal terminable unit," which he described as consisting of "one main clause with all the subordinate clauses attached to it" (1965, p. 20). The T-unit has become one of the most widely used elements in research related to structure of spoken and written language of children.

Recent and mostly unpublished research by a number of leading language and reading experts is beginning to address the complex question of the interrelationships of children's receptive and productive language processes with thinking and learning. Intuitive knowledge about language, cognitive clarity, and cognitive control and consciousness are terms used to designate the study of linguistic awareness.
Linguistic awareness is described by Mattingly (1978) as the ability of a speaker-hearer to bring the grammatical and in particular the phonological knowledge he has to the task of reading and writing. Linguistic awareness is directly related to language acquisition, and for some children their acquisition mechanisms continue beyond the point necessary simply for processing spoken sentences, while for others the task is abandoned once the period of learning to talk has passed and the mechanisms then atrophy. For the former—the linguistically aware...the phonological segmentation of the morphological structure of words is intuitively obvious...but to those who lack linguistic awareness, the principles by which orthography transcribes words seems quite mystifying (Pidgeon 1979, p. 1).

It seems clear to many children how their spoken language works is as much a mystery as how reading and writing work. Downing has pointed out that most children learn to become skilled in speaking without knowing how they do it. In developing literacy skills a child "has to become aware of his own language behavior if he is to understand how written language operates" (Downing 1979, p. 3).

Carol Chomsky (1979) thinks the key to linguistic awareness is in the speaker's ability to make conscious judgments based on unconscious principles. She disagrees with Mattingly on the role of consciousness in linguistic awareness. "Linguistic awareness does entail consciousness on the part of the speaker, resulting from the ability to reflect on language and view it objectively. This ability develops slowly in children, and it is far easier to raise linguistic consciousness in adults than it is in young children" (Chomsky, C., 1979, p. 2). Downing (1979) supports these views, stating that the
fundamental characteristic of successful use of written language must be clarity of thinking.

Although only a few linguists and researchers have explicitly defined the differences between oral and written language, most agree that what is known about oral language acquisition has implications for research, for written language acquisition and development, and for teacher education.
CHAPTER THREE

RESEARCH METHODOLOGY

This chapter describes the research procedures used in conducting the study. The chapter includes: 1) a description of the sample; 2) implementation of classroom programs; 3) instrumentation; 4) experimental design; 5) analysis of data; 6) and a summary of procedures.

Sample

The sample used for this study consisted of 70 third grade children enrolled in FT and NFT classrooms in a mid-sized midwestern city public school system. This school system has generated data on a population of FT and local comparison classrooms. This data is based on 200 randomly selected Head Start and comparable preschool program graduates each year in FT classrooms which implement an innovative educational program called the Tucson Early Education Model (TEEM) and NFT classrooms utilizing a traditional curriculum (San Diego County Monograph 2 1965). For the purposes of this study, 70 subjects were randomly drawn from this population of third grade children. The criterion of the selection of all subjects was their continuous enrollment in FT and NFT classrooms since their kindergarten or first grade year. This criterion ensured an enrollment in either program for a minimum of first, second, and third grades, which allowed sufficient
exposure of subjects to each program needed for the examination of program effects at the end of third grade. Of the 70 subjects, 34 were selected from FT classrooms in four schools and 36 from NFT classrooms in four different schools. The FT sample consists of 18 females and 16 males with an age range of eight years, eight months to ten years, three months, with a mean of nine years, three months. In the NFT sample, 19 are female and 17 are male with an age range of eight years, eight months to ten years, six months, with a mean of nine years, four months.

**Implementation of Classroom Programs**

Two different classroom approaches to language teaching and learning were examined in this study. Documentation of the implementation of the TEEM program came from the national FT evaluation report on this community (Apt Study 1975), documentation by TEEM personnel (Rentfrow 1978), and the results of TEEM-specific assessments of level of classroom implementation (TII 1976). NFT classroom programs were documented by community report and a separate TEEM study on reading which contains a description of classroom reading and language programs. Characteristics of each classroom program are outlined in Figure 1, which follows.
### Classroom Language Program Characteristics

<table>
<thead>
<tr>
<th>TUCSON EARLY EDUCATION MODEL</th>
<th>TRADITIONAL PROGRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive-field-Theory Base</td>
<td>Behavioristic Base</td>
</tr>
<tr>
<td>Difference View of Language Learning</td>
<td>Deficit View of Language Learning</td>
</tr>
<tr>
<td>Individualized Instructional Objectives Based on Child's Experiences and Knowledge</td>
<td>Sequential Heirarchy of Behavioral Objectives of Predetermined Skills and Content</td>
</tr>
<tr>
<td>Child-Centered</td>
<td>Teacher-Centered</td>
</tr>
<tr>
<td>Development of Intrinsic Motivation from Child's Natural Interest and Ability to Learn</td>
<td>Reinforcement and Behavior Modification Techniques Used as External Motivation</td>
</tr>
<tr>
<td>Integrated Classroom Day</td>
<td>Specific Subjects Taught at Certain Times</td>
</tr>
<tr>
<td>Interpersonal Functional and Cognitive Uses of Language Stressed</td>
<td>Academic Emphasis on Language Use</td>
</tr>
<tr>
<td>Language Used in Functional Settings</td>
<td>Studying About Language Through Grammar, Language Drill</td>
</tr>
<tr>
<td>Child's Ability to Communicate Effectively Through Speaking and Writing Through Personal Evaluation of Effectiveness</td>
<td>Tests Measure Mastery of Specific Behaviors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low</th>
<th>Instructional Structure</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Teachers Talk</td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>Student Invovlement</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Figure 1:** TEEM and Traditional Classroom Characteristics
The National Follow Through Evaluation Report related data from teacher questionnaires to the goals of TEEM as implemented in this community. The results indicated teaching practices that encouraged independence and flexibility in learners through use of small groups and individualized instruction, with teacher cluster scores on these measures ranging from 40.5 to 61.4 with standard deviations above the national mean ranging from .7 to 1.1 (Apt Study, 1975). The TEEM Implementation Inventory (TII) assesses by classroom the level of implementation in nine designated program areas (see Appendix B for complete description). TII's given by classroom in the spring of the year of this study were tabulated and percentage levels of degree of implementation computed by classroom, school, grade levels and FT community (TII, revised copy 1979). The TII implementation results (TII Results 1976) indicate by percentage the third grade classrooms' implementation levels in each of the nine categories of the curriculum. These results were as follows in Table 1.

Table 1.

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Curriculum</td>
<td>76%</td>
</tr>
<tr>
<td>II. Staff Planning Time</td>
<td>52%</td>
</tr>
<tr>
<td>III. Physical Setting</td>
<td>86%</td>
</tr>
<tr>
<td>IV. Whole Group Planning and Discussion Time</td>
<td>77%</td>
</tr>
<tr>
<td>V. Committee Time</td>
<td>75%</td>
</tr>
<tr>
<td>VI. Child Selection Time</td>
<td>67%</td>
</tr>
<tr>
<td>VII. Eating Time</td>
<td>NA</td>
</tr>
<tr>
<td>VIII. Physical Activity Time</td>
<td>NA</td>
</tr>
<tr>
<td>IX. Whole Group Activity Time</td>
<td>56%</td>
</tr>
</tbody>
</table>
To look specifically at elements of the TEEM language and reading programs each relevant individual item was also examined. Percentages of third grade classroom implementation by objective are detailed in Appendix C. Scores on individual language objectives are higher than the composite scores for each category, indicating a greater degree of implementation in the language areas of the curriculum. The objectives point out the unique language features of the Tucson Follow Through Model. Characteristics of all comparison or NFT classrooms are documented as using basal series for their reading and language arts program with duplicated materials, other basal readers, and library books used as supplemental materials (Ewaldt 1976). The information provided in the studies described delineates the differences between FT and NFT language programs and documents implementation of each.

Instrumentation

Two situational language tasks were used to obtain samples of third grade children's oral and written language and to measure complexity of structure and diversity of meaning within those samples. Both instruments, the Children's Language Assessment-Situational Tasks (CLA-ST) and the Productive Language Assessment Task (PLAT), were developed by Follow Through Model Sponsors to measure children's developing productive language skills. Together the Children's Language Assessment-Situational Tasks and the Productive Language Assessment Task assess oral and written language abilities untapped and unmeasured by formal standardized language tests.
Children's Language Assessment-Situational Tasks

The Children's Language Assessment-Situational Tasks (CLA-ST, Appendix D) was developed at the University of Arizona by Eva Conrad, Robert Rentfrow, and Keith Meredith. The tasks involved recording of children's oral language in several contexts, and transcribing, coding, and analyzing for linguistic diversity, syntactic performance, and qualitative style. Language samples were collected by tape recording in small groups and in one to one sessions. Children's responses to standardized open-ended questions about eight stimuli cards were recorded. (See Appendix D for a complete description of procedures.) After the samples were collected, a consensus method on an established percentage of agreement of reliability was used by the research staff for the transcription of the tapes and the coding of the language variables. Twenty percent of each staff's coding was recorded by another member of the research staff. The resulting scoring reliability for all language variables was found to be 94 percent on the average, with a range of 89 percent to 100 percent (Conrad, Rentfrow, and Meredith 1976).

Productive Language Assessment Tasks

The Productive Language Assessment Tasks (PLAT, Appendix E) was developed at the High Scope Education Research Foundation in Ypsilanti, Michigan. The instrument was designed to measure children's abilities to express themselves through written language (PLAT 1975). Two separate writing tasks are used—a reporting task and a narrating task. In both tasks, children were given a set of relatively
unstructured materials to help them make up a story. After 30 minutes, children were asked to write what they made and then a make-believe story. Children were allowed to interact with one another during all parts of the tasks.

A total of 32 variables related to both the narrative and the reporting language samples were coded and recorded. However, only three of the obtained variables were used for this study. Inter-scorer agreement was obtained by having all observers code all scores. Ebel's intraclass correlation (Guilford 1954) was used to estimate scoring reliability. Scoring reliability was high with all intraclass correlation coefficients exceeding .90 (Bond 1976).

**Selected Measures of Linguistic Complexity and Diversity**

To examine the relationship between sentence structure and content words within the spoken and written language of third grade children, measures had to be selected which were common to both language assessment tasks and which would lend themselves to analysis across spoken and written language. For measurement of complexity of sentence structure, the thought unit, or T-unit, measure and the percentage of complex T-units were chosen. The T-unit has been used as a reliable measure of language complexity since the early sixties (Hunt 1965).

Language content words as evidenced in the vocabulary size measure of the type-token ratio was selected as the language diversity measure. The type-token ratio is the ratio of the number of different words (types) to the number of words (tokens) (Carroll 1964). High
type-token ratios indicate more linguistically diverse speech than do lower ratios.

Research Procedures

Language samples were gathered from FT and NFT third grades in each of the three language tasks and then analyzed for measures of linguistic complexity and diversity. Two of the language samples were written and one was oral. These language samples were obtained within the context of the classroom setting (Rentfrow 1975, p. 2) "so that the information gathered reflects the real-world behavior of children and teachers."

The first situation was a written reporting task. Each child in a group of four to six children was given a packet of common materials (e.g., square of styrofoam, pieces of fabric, braids, cotton, etc.). In addition, several colored felt pens, scissors, and tape were available to the group. After allowing the children to freely play with the materials, the tester asked the children to write "how they made what they made." The children were allowed to write for a maximum of 30 minutes.

The second situation was a written narrative task. Each child in a group of four to six was given a box containing five dowels in varying sizes, a block-and-bottle-cap car, various colored blocks, and some pieces of felt. The children were encouraged to play singly or together with the materials. After allowing the children to play for 30 minutes, the tester asked each child to write a make-believe story. In both writing tasks the tester freely spelled words upon
The children were allowed to write for a maximum of 30 minutes. (See Appendix E for detailed account of procedures.)

The third language elicitation situation was an oral narrative task. Children worked in a one to one situation where an adult tester asked structured questions about a set of eight cartoon cards for 15 minutes. These sessions were tape-recorded and later transcribed for data analysis purposes. (See Appendix D.)

After collection of the language samples, the tapes of the oral session were transcribed and coded. The written stories were also scored. These three samples were coded and analyzed for all variables on both the Children's Language Assessment-Situational Tasks and the Productive Language Assessment Task instruments. (See Appendix F for listing of all variables.) A consensus method, an established percentage of agreement of reliability, was used for the coding of the language variables. From the larger set of coded language variables, mean scores of the measures of linguistic complexity and diversity were calculated. Using these selected language measures, comparisons were made to determine what differences existed between the oral and written language of third grade children in different language programs.

Reliability and Validity of the Instruments Used

Reliability

Even though no empirical data is available to indicate the reliability of the instruments, inferences about the reliability could be made on the basis of the findings of the research studies utilizing those instruments. First of all, there is some research
evidence indicating the stability of scores (Conrad et al. 1974, 1976; Bond 1976; PLAT Manual 1975) obtained from each of the instruments over a period of time. Secondly, the use of these instruments has resulted in the demonstration of consistent differences between the groups by several researchers (Conrad et al. 1974, 1976; Rentfrow 1975, 1978; Hillyer 1978; Bond 1976; PLAT Manual 1975).

Validity

Both the CLA-ST and the PLAT instruments were judged to have high content validity in that they sample the types of language production developed within the goals of each program and they analyze language which is produced within the context of each Model Sponsor's curriculum (Conrad et al. 1976; Bond 1976). These two language assessment instruments also have substantial face validity; "they are appropriate measures of general educational goals and real-world competencies" (Bond 1976, p. 3). In a study conducted by Conrad et. al (1976) the usage of these instruments resulted in language pattern consistencies at different ages reflecting construct validity across age levels.

Experimental Design and Data Analysis

A posttest only control group design was used for the purpose of this study (Campbell & Stanley 1966). This experimental design provided a way to measure changes or differences between two groups due to treatment. Randomly selected subjects were assigned to two groups consisting of subjects in FT and the control group consisting of children in NFT classrooms. Treatment was the language-centered program of
TEEM while the trials were the language samples from each child, two written and one oral.

Two separate analysis procedures were utilized. One analysis consisted of a two-way analysis of variance with repeated measures. This analysis was aimed at determining program impact on the linguistic complexity and diversity of structure and meaning measures in the oral and written language of FT and NFT children. A correlational analysis was also performed to determine the relationship between the oral and written language patterns for the subjects of both the control and experimental groups. These two procedures were selected for several reasons. They allowed the comparison of two or more categories of independent variables. They also provided for comparison of simultaneous but separate effects of two or more variables and could assess interaction effects and relationships of two or more variables.

The main effects to be studied were those of FT and NFT (treatment) and of the difference between oral and written language (trials). The interaction effect results from combining program efforts with oral and written language in relation to the linguistic complexity and diversity measures. Independent variables within the study were those of the two groups, FT and NFT, and of the samples of oral and written language. The three dependent variables were the complexity measures of number of simple T-units and the percentage of complex T-units, while the diversity measure was the type-token ratio. Table 2 defines the language variables used as dependent measures.
Table 2.
Operational Definitions of Language Analysis Variables

<table>
<thead>
<tr>
<th>Linguistic Complexity Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Thought-Units Frequency and Type</td>
</tr>
<tr>
<td>a. T-units: thought-units, the minimum part of a sentence that can stand alone</td>
</tr>
<tr>
<td>b. Slash marks will be used to indicate the boundaries of each T-unit</td>
</tr>
<tr>
<td>c. All language used will be classified as complete or incomplete T-units</td>
</tr>
<tr>
<td>d. If the T-unit is complete, it will be further classified as follows:</td>
</tr>
<tr>
<td>c\textsuperscript{1}: simple sentences without phrase (such as 'you' in a comment)</td>
</tr>
<tr>
<td>c\textsuperscript{2}: simple sentences with adverb or adjective phrase, compound subject or predicate</td>
</tr>
<tr>
<td>c\textsuperscript{3}: complex sentences with one main clause and one subordinate clause</td>
</tr>
<tr>
<td>2. Percentage of Complex T-units</td>
</tr>
<tr>
<td>a. Count the total number of complete T-units</td>
</tr>
<tr>
<td>b. Count the total number of complex T-units</td>
</tr>
<tr>
<td>c. Form the percentage of complex T-units by placing the total number of complex T-units over the total number of complete T-units.</td>
</tr>
</tbody>
</table>
Table 2
continued

<table>
<thead>
<tr>
<th>Linguistic Diversity Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Type-Token Ratio</td>
</tr>
<tr>
<td>a. Type is the number of different words</td>
</tr>
<tr>
<td>Token is the total number of words</td>
</tr>
<tr>
<td>b. Addition of an &quot;s&quot; to a word already used does not constitute another type unless it is a contraction</td>
</tr>
<tr>
<td>c. The type-token ratio will decrease as sample size increases because fewer and fewer of the words will not have occurred in the samples already counted. To make the ratio independent of sample size, the number of different words (types) will be divided by the square root of twice the number of words (token) in the sample (Carroll 1964, p. 54)</td>
</tr>
<tr>
<td>d. Count number of types and tokens, then take the number of tokens times two, find the square root of that number, and divide the number of types by the square root of the tokens times two:</td>
</tr>
<tr>
<td>[ TTR = \frac{Ty}{\sqrt{To \times 2}} ]</td>
</tr>
</tbody>
</table>
CHAPTER FOUR

FINDINGS

This chapter summarizes the findings of the study and examines the results in light of the stated hypotheses. The obtained data is reported in three sections: to examine the comparative effectiveness of two educational programs with regard to the development of oral and written language competencies; to determine the relationship between two types of linguistic skills; and to substantiate previously stated hypotheses in light of the obtained results.

Effectiveness of Follow Through and Non Follow Through Programs

A two-way (language trials by groups) analysis of variance with repeated measures was conducted to determine the impact of two different approaches to the teaching of language on the linguistic complexity of structure and diversity of meaning measures of the oral and written language of FT and NFT third grade children. The measures of complexity included the number of T-units and percentage of complex T-units, while linguistic diversity was measured by use of the type-token ratio. Analysis of variance results related to each of these three dependent measures are summarized in Table 3.
Program Effects on Linguistic Complexity

With regard to the impact of the FT and NFT approaches on the development of the two linguistic complexity measures, the data contained in Table 3 indicated that there were no significant differences in the performance of the two groups of subjects ($F = 0.13$, $df = 1/68$, $p < .72$). The average performance of the FT subjects for the number of T-units was found to be 31.60, whereas the average complexity score for the NFT group was 32.33, indicating a high similarity in the
linguistic complexity of the two selected groups (see Appendix G for summary tables of means and standard deviations).

Similarly, when the percentage of complex T-units was used as a measure of linguistic complexity, the obtained data, percentage of complex T-units, indicated no significant differences in the performance of the two groups of subjects ($F = .001$, $df = 1/68$, $p < .98$). The average performance of the FT subjects for the percentage of complex T-units was found to be .15, whereas the average score for the NFT group was .15, indicating a high similarity in the complexity of the sentences used by the two groups of subjects.

Program Effects on Linguistic Diversity

With regard to the impact of the FT and NFT approaches on the development of linguistic diversity, the data contained in Table 3 revealed that there were no significant differences in the performance of the two groups of subjects ($F = 3.39$, $df = 1/68$, $p < .07$) on the type-token ratio measure. The average diversity score for the FT subjects was found to be 3.40, whereas the NFT group had a mean score of 3.21, indicating a high similarity in the linguistic diversity of the selected groups.

Differences Between Oral and Written Language

Two-way (method by language trails) analysis of variance with repeated measures was conducted to determine the differences between oral and written language on the linguistic complexity of structure and diversity of meaning measures of FT and NFT third grade children.
The language trials consisted of obtaining two written samples (a reporting and a narrating task) and one oral language sample from all subjects within each group. Analysis of variance results related to the examination of the differences between oral and written linguistic skills and interaction effects are summarized in Table 4.

Table 4.
Analysis of Variance Summary of Linguistic Complexity and Diversity Measures for Oral and Written Language Trials of FT and NFT Groups

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of T-units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>2</td>
<td>111728.92</td>
<td>656.90***</td>
</tr>
<tr>
<td>G x T</td>
<td>2</td>
<td>118.67</td>
<td>.70</td>
</tr>
<tr>
<td>Error (T)</td>
<td>136</td>
<td>170.08</td>
<td>.77</td>
</tr>
<tr>
<td>Within Total</td>
<td>140</td>
<td>1763.05</td>
<td></td>
</tr>
<tr>
<td><strong>Percentage of Complex T-units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>2</td>
<td>.54</td>
<td>8.52***</td>
</tr>
<tr>
<td>G x T</td>
<td>2</td>
<td>.05</td>
<td>.07</td>
</tr>
<tr>
<td>Error (T)</td>
<td>136</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Within Total</td>
<td>140</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td><strong>Type-Token Ratio</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>2</td>
<td>18.86</td>
<td>56.58***</td>
</tr>
<tr>
<td>G x T</td>
<td>2</td>
<td>.02</td>
<td>.07</td>
</tr>
<tr>
<td>Error (T)</td>
<td>136</td>
<td>.33</td>
<td></td>
</tr>
<tr>
<td>Within Total</td>
<td>140</td>
<td>.59</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
*** p < .001
Linguistic Complexity in Oral and Written Language

The differences between oral and written linguistic complexity measures were found to be significant ($F = 656.90$, $df = 2/136$, $p < .001$). The average performances for the two written language samples were 6.23 ($SD = 3.37$) and 11.70 ($SD = 6.60$) respectively, whereas the mean score for the oral language sample was 78.0 ($SD = 22.33$), indicating dissimilarity in the complexity of oral and written language usage.

Similarly, when the percentage of complex T-units was used as a measure of linguistic complexity, the obtained data indicated a significant difference between oral and written language ($F = 8.52$, $df = 2/136$, $p < .001$). The average complexity scores for the two written language samples were .06 ($SD = .12$) and .23 ($SD = .41$) respectively, whereas the mean score for oral language on this measure was .15 ($SD = .10$), indicating differences in the complexity of sentence structure used in oral and written language.

Linguistic Diversity in Oral and Written Language

With regard to the differences between oral and written language on the linguistic diversity measure by use of the type-token ratio measure, the data contained in Table 4 revealed significant differences between oral and written language ($F = 56.58$, $df = 2/136$, $p < .001$). The mean diversity scores for the two written language samples were 2.70 ($SD = .58$) and 3.62 ($SD = .71$) respectively, whereas the mean score for the oral language sample was 3.58 ($SD = .62$), pointing out the dissimilarity in the linguistic diversity of oral and written language.
It should be noted in all the analyses, no interaction between main effects (instructional methods and language trials) were found to be significant. The absence of significant interaction effects led to the conclusion that the differences between oral and written language were found to be similar for the FT and NFT subjects. Thus the two approaches to the development of language had no variable impact on the oral and written language skills of the two groups of sampled subjects.

**Relationship Between Oral and Written Language**

A Pearson product-moment correlation coefficient was computed to determine the relationship between the oral and written language measures for the subjects of both the groups. The correlation coefficients obtained for written and spoken language for the FT and NFT groups are presented in Table 5.
Table 5.

Relationship Between Oral and Written Language Variables of FT and NFT Subjects

<table>
<thead>
<tr>
<th>Written Language Variables</th>
<th>Oral Language Variables</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T-units</td>
<td>% Complex T-units</td>
<td>TTR</td>
</tr>
<tr>
<td>Follow Through Subjects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.23</td>
<td>.15</td>
<td>-.26</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>-.17</td>
<td>-.10</td>
<td>.02</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>-.03</td>
<td>.04</td>
<td>-.04</td>
</tr>
<tr>
<td>Written 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.30*</td>
<td>.10</td>
<td>-.02</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>.27</td>
<td>.02</td>
<td>.05</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>-.15</td>
<td>-.10</td>
<td>.05</td>
</tr>
<tr>
<td>Combined Written</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(W1 + W2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.33*</td>
<td>.14</td>
<td>-.11</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>.09</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>-.12</td>
<td>-.04</td>
<td>.01</td>
</tr>
<tr>
<td>Non Follow Through Subjects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.08</td>
<td>.24</td>
<td>-.01</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>-.03</td>
<td>-.20</td>
<td>-.17</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>.03</td>
<td>.05</td>
<td>.10</td>
</tr>
<tr>
<td>Written 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.09</td>
<td>.39**</td>
<td>.13</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>.09</td>
<td>.20</td>
<td>.03</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>.06</td>
<td>.28*</td>
<td>.29*</td>
</tr>
<tr>
<td>Combined Written</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(W1 + W2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-units</td>
<td>.10</td>
<td>.39**</td>
<td>.08</td>
</tr>
<tr>
<td>% Complex T-units</td>
<td>.08</td>
<td>.17</td>
<td>.002</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>.06</td>
<td>.21</td>
<td>.24</td>
</tr>
</tbody>
</table>

* p < .05
**p < .01
Follow Through Program

The data for the FT group in Table 5 indicates the relationship between oral and written language measures of complexity and diversity is significant in only two areas. Significant relationships were found between the number of T-units in oral language and both the number of T-units in the second written sample and the number of T-units in the combined written samples. The magnitude of those correlations was .30 and .33 respectively, indicating a significant but low relationship between the number of T-units in oral language and in the written narrative and combined written samples of FT children.

Of the remaining 25 correlation coefficients reported, 14 were positive and 11 were negative. No significant patterns were evident in the correlation coefficients. The positive correlations ranged from .01 to .27, whereas the negative correlations ranged from -.01 to -.26, indicating low to no relationship between the linguistic measures of complexity and diversity of oral and written language of the FT group.

Non Follow Through Program

The data for the NFT group reported in Table 5 indicates results similar to the FT group. However, four relationships were found to be significant, all of them being between different variables than those reported for the FT group. Significant relationships were found between the percentage of complex T-units in oral language and both the T-unit measure for the second or narrative written sample ($r = .39$) and the T-unit for the combined written samples ($r = .39$), between the
oral percentage of complex T-units and the type-token ratio of the second written sample \( r = .28 \) and between the oral type-token ratio and the type-token ratio for the second written sample \( r = .29 \).

Of the 23 remaining correlations, 19 were positive and 4 were negative. This finding differs from the FT sample by having more positive relationships; however, all of the correlations are low, indicating no relationship between the oral and written language variables. The positive correlations ranged from .03 to .24, and the negative correlation coefficients ranged from -.01 to -.20. Again, low to insignificant relationships appear, indicating no relationship between the oral and written language of the NFT group.

Combined FT and NFT Subjects

The Pearson product-moment correlation coefficient was also computed on the language measures of the combined FT and NFT groups to determine the relationship between linguistic complexity and diversity measures of oral and written language. The correlation coefficients obtained for oral and written language for the combined groups are presented in Table 6.
The data obtained for the combined group of subjects in Table 6 indicates the relationship between oral and written language is significant for several variables. Significant relationships were observed between oral language as measured by T-units and the combined written T-unit measure ($r = .20$), and between oral percentage of complex T-units and the number of T-units for the first written sample ($r = .21$), the second written sample ($r = .25$), and also for the number of T-units for the combined written samples ($r = .28$). Even though significance...
was obtained, the four correlation coefficients indicate low positive relationships between these oral and written language measures.

Of the remaining 23 correlation coefficients, 15 were positive and 8 were negative. Positive correlations ranged from .02 to .19, and negative correlations ranged from -.004 to -.12, indicating no relationships between the linguistic measures of linguistic complexity and diversity in oral and written language of the combined groups of subjects.

Testing of the Hypotheses

For the purposes of this study, the hypotheses, stated primarily in the null form, were tested at the .05 level of significance.

Hypothesis One stated that there is no significant difference between Follow Through and Non Follow Through children on measures of complexity and diversity. The obtained results indicated there is no significant difference between the two groups on oral and written linguistic measures of complexity and diversity. Therefore, this hypothesis was retained.

Hypothesis Two stated that there is no significant difference between oral language and written language as measured by linguistic complexity and diversity. Results with regard to this hypothesis indicated a significant difference between oral and written language on measures of linguistic complexity and diversity for both groups of subjects. These results led to the rejection of this hypothesis at the specified alpha level.
Hypothesis Three stated that there is no significant interaction between methods and language trials for the FT and NFT subjects with regard to the oral and written language measures of linguistic complexity and diversity. The obtained results indicated a nonsignificant interaction between the two groups on oral and written linguistic measures of complexity of structure and diversity of meaning; therefore, this hypothesis was retained.

Hypothesis Four stated that there is no relationship between oral and written language on measures of linguistic complexity and diversity for the subjects exposed to two different kinds of educational programs. The obtained results indicated no relationship between oral and written language measures of linguistic complexity and diversity for the subjects exposed to two different kinds of educational programs. Therefore, this hypothesis was retained.

Hypothesis Five stated that there is no difference between the correlation coefficients of written and spoken language obtained for the FT and NFT subjects. The difference between written and spoken language obtained for the FT and NFT groups indicated there is no significant relationship between oral and written language. Therefore this hypothesis was retained.

Examination of all of the above stated hypotheses revealed no difference between the two groups of subjects with regard to the type of educational language development program they participated in. However, there were significant differences between the oral and written language competencies for all subjects within each group. Linguistic
complexity of structure and diversity of meaning measures in oral and written language were relatively independent of one another. Linguistic competencies in one mode, oral or written, did not predict competency in the other mode. The same variables in oral and written language showed little or no relationship to each other.
CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

Follow Through and Non Follow Through Differences

The data indicated that the two groups, FT and NFT, did not differ significantly in their language usage. A possible explanation for this finding could be the developmental stage of the children at the time they were tested. Students' average ages were nine years, three months, for FT and nine years, four months, for the NFT group, putting them in the concrete operations stage of Piaget's developmental hierarchy, a stage in which most are not yet able to deal with complex problems of reasoning through verbal communication (Piaget 1966). This abstract reasoning results in expressing ideas in more complex sentences using subordinate clauses and embedded meanings (Hunt 1965). This could also express the relationship of language's deep structure to its surface structure. The longitudinal studies of Hunt (1965) and Loban (1963) both emphasize that maturity in language usage includes a greater variety of sentence structuring and increases with age to varying degrees. It is possible that the effects of early language training programs will not result in differences in complexity until a later age for elementary children. So the result of no differences between the two groups may be related to the developmental level of children at the end of their third-grade year.
The surface structure analysis of language by itself does not tell what a child knows or thinks about what he experiences. The structure measure must be balanced with a qualitative measure. The type-token ratio, used as a measure of linguistic diversity, provided evidence of a child's understanding of different concepts. This linguistic diversity measure should, in this researcher's opinion, show more of a difference in language usage due to program effects at an earlier age, than measures of structure. On the type-token ratio measure, the differences between the FT and NFT groups were not significant, but greater differences were shown than between the two groups on the complexity measures. The average diversity score for the FT group was 3.40, whereas the NFT group had a mean score of 3.21. When examining the mean scores for the type-token ratio on each language trial (Appendix G) the FT children consistently scored higher. These differences indicate a trend toward higher scores on this measure for the FT group even though the differences were not significant.

**Oral and Written Language Differences**

Significant differences were found between oral and written language on all three dependent measures. These results may be due to several factors. The obtained differences between oral and written language usage can be explained from several viewpoints. First, children at the third-grade level can express their thoughts orally to a higher degree than they can in writing. A child at this age will generate much more oral language in 15 minutes than he will in 30 minutes of writing. This is due to several constraints of written
language, such as spelling, punctuation, and cursive or manuscript writing. Longer language samples would result in higher scores on the T-unit measure. Interestingly, the percentage of complex T-units remained relatively stable, regardless of the total number of T-units. The combined group percentages for each of the language samples ranged from 6% to 23%. Percentages for the FT group were from 8% to 20% and 4% to 26% for the NFT group. When the two written language samples were combined for both groups, the percentages were the same for the oral and written language, 15%. This finding is inconsistent with studies of Halliday (1980) and Ure (1970) comparing the lexical density scores (number of form class words to the number of total words) of oral and written language. Again, their work primarily speaks of adult language, and the results obtained in this study of third graders reflect developmental levels. Halliday (1980) and Ure (1970) characterized spoken language as having complex sentence structure with a low, under 40%, lexical density, and written language as having simple sentences with a high, over 40%, lexical density.

Another explanation for the differences in oral and written language is that oral and written language are used for different purposes or to serve different functions, and each has different conventions that affect its usage. Children are aware of these differences at an early age, and schooling increases awareness of the uses of both of these productive language skills (Downing 1979). A result of
the study that reflects this difference of functions of the spoken
and written language is seen between both complexity and diversity
scores for the first written language sample which was a reporting task
and the second written task which was a narrative or make-believe
story. Mean scores for all measures of both oral and written language
(Appendix G) show a greater difference between the two written samples
than between the oral and combined written scores. The differences on
the percentage of complexity and the diversity measure were .06 and
2.70 for the reporting task and .23 and 3.62 for the narrative task and
.15 and 3.58 for the oral language sample. This finding points out the
importance of purposes or functions of language use. Language usage
differs depending upon the context in which it is used and children
need to develop these differing skills (Allen 1976).

Relationship Between Oral and Written Language

Correlational procedures used to examine the relationship
between oral and written language for each group as well as the com-
bined group of subjects resulted in low to insignificant relationships,
indicating somewhat, the independence of the two linguistic skills.
This finding indicates that competency in oral language may not be a
good predictor of competency in use of written language for this group
of children. The low significant relationships that were found
differed for each group and again showed much variation between the
two written samples. No significant relationships occurred for either
group on the first reporting task. Only one relationship was found
on the combined group of scores and that occurred between the T-unit measure and the percentage of complex T-units in each written sample. The combined written results do not seem, in this researcher's opinion, to be useful as the variations were so different between the two written samples, again indicating that language is used differently depending on its function.

More significant relationships were found between the oral and written language for the NFT group than for the FT group. This possibly indicates a somewhat greater similarity in language use in oral and written modes for the NFT group. It would seem consistent with the trend found in the analyses of various results between oral and written language use of each group. The FT group scores could indicate more linguistic awareness of the different functions of language use due to the program effects of the language-centered FT curriculum. Again, it is possible that results shown may be a factor of the age of the children and the amount of time spent in differing programs. Longer time in each program could result in much different relationship patterns for each of the groups.

**Recommendations**

Based on the results of this study, the following recommendations are made:

1. To better analyze the effects of different programs on children's language use, longitudinal studies should also be done on the same children at varying developmental stages. Results of those
language analyses would give needed information on the complex issues of approaches to language development.

2. To better understand the theoretical issues of the language to thought relationship, ways to examine and compare the deep structure of the language of groups of children in different programs need to be explored. A way to map the meaning or conceptual development represented by language could result in very different results and a better understanding of the relationship of surface structure to deep structure in the language of the developing child.

3. Another approach to studying the structure and meaning relationships in the language of young children could be made through use of the same procedures, but adding a component that asks the children about their conceptions and understandings of language use. Comparisons could be made of the linguistic awareness of a child in relationship to his linguistic performance.

4. Studies of both oral and written language use should be done on the same groups of children in a wide variety of situations. This could show what effects programs have on developing linguistic awareness, resulting in a greater differentiation and sophistication of language use.

5. Continued teacher training and additional research need to be done on the use of an integrated language experience approach and its effects on children's language development. The positive trend shown on the linguistic diversity measure and the differing relationships in use of oral and written language are both consistent
with findings from earlier studies (Allen 1976; 1981; Conrad et al. 1976). Further investigation and validation in light of the complexities and interrelationships of children's developing productive language abilities is recommended.
APPENDIX A

TUCSON EARLY EDUCATION MODEL

PROGRAM DESCRIPTION
APPENDIX A

TUCSON EARLY EDUCATION MODEL

Introduction and Description of the Tucson Early Education Model

The Tucson Early Education Model (TEEM) of the University of Arizona Center for Educational Research and Development had its beginnings in 1965 under the leadership of Dr. Marie Hughes. The Model was developed as an innovative educational program in the Tucson, Arizona, public schools. In 1968 it became a National Follow Through Model Sponsor.

The Tucson Early Education Model is based on certain philosophical assumptions about children and the learning process. These include that each individual is unique and has a unique set of environmental experiences; has a natural thrust for growth that results in purposive behavior; has a basic need for preservation of self-esteem; has the potential to learn; learns as he interacts with his environment; and learns as he selects experiences that match his capabilities and inner needs. Based on these beliefs about children and learning, and on research in the behavioral sciences and child growth and development, the Tucson Early Education Model was developed within the cognitive-field theoretical framework. In addition to the Instructional component, the components of Parent Involvement, Psychological Services and Research and Evaluation were part of the model design.
The Instructional Component

In order to implement the Instructional component there has to be a coordination of the TEEM Curriculum and its goals within the physical setting and classroom organization including the behaviors of the teacher. The combined interrelationship of these areas with active children results in a unique program that differs significantly from conventional curricula and models of instruction for young children. At the same time the content and procedures of the TEEM program focus on skills and concepts necessary for children to develop in order to function in today's technical and changing society.

The Curriculum and the Learning Environment

The Curriculum: Language development, development of learning to learn skills, motivation for learning, and societal arts and skills including the skills of a technical society such as reading, writing, math, and the social skills of living and working with other people provide the curriculum and the framework for planning, implementing, and evaluating on-going classroom activity. The teacher accounts for and extends all of these areas of development within all instructional settings. Curriculum encompasses all activity of children within the school day, and children's experiences are the core of this curriculum. These experiences provide teachers with the means for relating children's individual development to development of classroom activity. Play is viewed as a dynamic form of learning and provides opportunity for total development of the child. The traditional subject areas, such as reading, writing, and mathematics are taught with a "Process Curriculum"
orientation. How the child learns is basic to developing what he learns. Emphasis throughout all activities is on the process of learning.

Four Goal Areas: Four major areas form the overall goals of the Tucson Early Education Model. Each of these goal areas is seen as equally important. They are designed to develop children's competencies in the following areas:

Language Base. The language base goal area stresses the development of language competence through the use of language as a medium of communication and a tool of thought. The natural language of the child is accepted and reinforced as the adult models more complex language and stimulates language growth. The child learns to use a variety of labels, descriptors, and language forms that are required for communication. The child also develops an understanding of the function of language in different settings.

Intellectual Base. Intellectual skills are defined as the mental processes required by children in order to process, organize and utilize information in order to transfer skills and generalize concepts to new situations. The development of these "learning to learn" skills is planned for within the TEEM classroom.

Motivational Base. The motivational base develops attitudes and behavioral characteristics that are related to participating productively in complex social situations. This includes helping the child develop a positive attitude toward himself,
towards school and the learning process.

**Societal Arts and Skills.** The emphasis in this goal area is on developing academic and social competencies. The skills of listening, speaking, writing, math, inquiry, and the interpersonal skills of planning, cooperation and communication are developed as an outgrowth of the child's own language and experiences.

**The Learning Environment and Physical Setting**

The learning environment of the Tucson Early Education Model utilizes all aspects of each child's language, home and community experiences and is not limited to the classroom setting and materials. Field trips, neighborhood walks, participation in community events and use of parents and other adults in the classroom provide additional meaningful experiences that are vehicles for development of concepts, language and specific skills. The classroom should reflect the distinctiveness of the children, their home and community experiences, the community setting and the local cultural environment.

The physical setting of the TEEM classroom is vital to the instructional program. The environment affects a child's learning, and provides motivation for involvement in learning activities. Children's work is displayed so they can see and use it. The work should show evidence that children's oral language is recorded and used for development of reading and writing skills in the form of talking murals, word walls, word banks, informal language samples, dictated stories and child-made books. Math skills are also taught in a functional sequential
manner within the context of a variety of activities, and children's current experiences in math are displayed in symbolic form through charts, graphs and pictoral representations.

Movable furniture is arranged to facilitate six or more learning centers or behavioral settings. Learning centers remain stationary and are used at various times during the school day. Provisions are made for individual storage space for children that is easily accessible. Also there needs to be an area in which there is room for all the children to assemble at one time.

Each learning center includes multilevel activities and materials which provide opportunities for children to relate past understandings to broader new experiences. Activities at learning centers should provide options for a child to approach a task or to learn a concept in several different ways.

Systematic record-keeping maintained by the teacher and by individual children provides daily and long range feedback on child progress and is used in planning for new experiences.

**Classroom Organization**

The TEEM classroom day is organized to include certain planned activities. These daily activities are necessary and contribute ways to the development of the total child. They include:

**Staff Planning Time:** Participation of all adults working in a classroom in a daily planning session is vital to the implementation of the Tucson Early Education Model. Continuous planning, implementation, and evaluation of the classroom
program results in an ongoing cycle referred to as the P.I.E.
Cycle. Records of children's progress and adult observations
form the basis for evaluation of the day as well as being used
to aid in planning for new experiences, and extending and
reinforcing previous learning. At the end of each session
decisions are summarized and a record is kept of the planning
session. These planning sessions enable the adults to provide
continuity of learning.

Whole Group Planning Time: Children are actively involved
in the planning, implementation, evaluation cycle that takes
place continuously in a TEEM classroom. As the child plans and
evaluates with the teacher he is involved in setting up and
assessing expectations for his own behavior and commits himself
to active participation in the learning process. This planning
also allows children to participate in the development of a
systematic approach to learning activities. This time may
consist of several short sessions during the day or of one
session at the end of the day. Whole group planning and dis­
cussion time is designed to facilitate planning with children
for organized activities and should not be confused with whole
group activity time.

Whole Group Activity Time: Whole group activity time is used
to complement the greater portion of the school day in which
children are working in individual or small group activities and
is less than 45 minutes. It is often used to make efficient
use of resource persons, materials, and equipment that are
limited in terms of availability. Activities such as music, story-telling, or reading of stories, drama, sharing and viewing different media take place during whole group activity time.

Committee Time: Children within TEEM classrooms are organized into small heterogeneous groups of no more than six children called committees. Each committee has a chairperson and the makeup of committees changes periodically. These committees function during a designated part of the day and children rotate through the various learning centers or behavioral settings in a systematic way. Teachers provide "invitations" to these learning centers in both verbal and written forms. Organizing children into small groups allows for more individualized attention to children's growth and development. It also allows children to develop and generalize knowledge and skills to a variety of behavioral settings. Peer interaction in a heterogeneous setting provides opportunity for peer modeling and peer teaching. Learning centers represent a way of organizing materials within the classroom while committees represent a way of organizing children into small groups.

Child Selection Time: Child Selection Time is a designated time of each day during which children are given an opportunity to choose an activity they want to do from a number of available activities. This daily experience is motivating, develops decision-making skills and helps children to develop commitment to a task and encourages completion of selected tasks. The
range and types of activities planned by the teacher and children help children to generalize concepts and skills from one setting to another, so that previous learning is reinforced and becomes useful to the child. Records are kept of children's choices, and adults actively participate with children or use this time for observing and recording children's behavior which provides the teacher with additional information about the children's growth and development.

**Eating Time:** Eating time refers to any time during the day when food and/or drink are served to the children such as breakfast, snack or lunch. This time allows opportunity to involve children in taking responsibility for routines such as serving food, preparing tables, etc. It also is used to stimulate language, as children and adults are free to interact with each other in a casual social situation. Health and nutritional habits are easily modeled and taught during this phase of the school day.

**Physical Activity Time:** Physical activity time is a time when the outdoor playground and the gym are seen as extensions of the classroom that can be used to further develop language, intellectual, social and physical skills. Activities may encourage: active or quiet play; group or individual play; involvement with a variety of materials such as sand, water, blocks, toys, skates, etc.; games with rules; or use of playground equipment. The emphasis is on variety and choice and involves observation and interaction on the part of the adult.
The Process Variables—Teacher Behaviors

Dr. Hughes had defined teaching as "decision-making in interaction." The quality of the response a teacher makes to a child or a group with whom he is interacting is stressed. Teachers in their "Professional Response" to children are trained to use seven specific processes which are necessary to enable the child to fully develop within the TEEM learning environment. These processes are referred to as the Process Variables and are crucial to the successful implementation of the TEEM program. They include the continuous use by the teacher of the following processes:

**Acceptance:** Above all else a TEEM teacher must provide a human environment that is accepting of each child and that communicates to each child that he is important and worthy. Teachers must accept a child's language, family and culture. She also accepts mistakes as a legitimate aspect of the learning process, respects the child as an individual, gives him opportunities to make decisions, accepts and uses his ideas and suggestions, believes in his potential to learn, and helps him to achieve success in some way every day.

**Individualization:** Each child comes to school with his own set of attitudes, skills, and style of learning developed from his past experiences. The teacher must be aware of these differences in interest and skills as she plans specific activities within the classroom to meet the needs of individual children. Individualization results when the teacher matches materials to a child's level of operation. The classroom
organization provides time for one-to-one and small group interaction so that individualization takes place.

**Modeling**: Modeling is widely recognized as a process by which children learn and change behaviors through observation and imitation of the actions and language of adults and peers. Children imitate behaviors of those people who are important to them within their environment. Teachers must become consciously aware that they are always modeling for children. Their actions, language, ability to listen and their interaction with others are forms of modeling. To use modeling as an effective teaching procedure, teachers must: establish a supportive relationship with the child; determine what is to be modeled; model the behavior in interaction with the child; mediate what is being modeled; provide a time and/or situation in which the child can practice the behavior; and reinforce the child's behavior as it occurs.

**Reinforcement**: Rewarding and gratifying experiences are important elements of the learning process and crucial to the development of a good self-concept. Every child should meet some success every day. Reinforcement should be specific, sincere, discriminating, frequent and directed toward behavior rather than toward the child as a person. The learning environment is planned and arranged to include additional reinforcers.

**Generalization**: Children need to develop the realization that specific skills used in one task are often skills that can be used in many ways and in a variety of settings. This process
is called generalization or transfer of learning. Teachers plan the learning environment so there is ample opportunity for children to generalize new skills to other situations. Previous learning becomes useful and is reinforced in this way.

**Orchestration:** Aspects of TEEM's four goal areas of language, intellectual, motivation and societal arts and skills are inherent in all learning situations. Orchestration is a term used in a way specific to TEEM that indicates each classroom experience attends to and develops skills in the four goal areas simultaneously. Teachers consciously plan activities within the learning environment that interrelate skills in language, intellectual processes, motivation and the societal arts and skills.

**P.I.E. Cycle:** Planning, implementation, and evaluation are part of a continuous education cycle in a TEEM classroom. The two levels of planning and evaluation, at the adult level and at the child level, are dependent upon each other. Outcomes of a teacher's planning depend upon the values she has about acceptance, individualization, reinforcement, modeling, generalization and orchestration. Planning is child centered and focuses on providing meaningful interaction between children and adults, between children and other children and between children and materials.

**Role of the Child**

The process variables describe the expected teacher behaviors
in the Tucson Early Education Model. TEEM also views the role of the child or of the learner in a distinct way. Children are viewed as active, contributing participants in the learning process. They assist in planning and evaluating daily and long-range learning activities and make decisions about classroom procedures and activities. They initiate work in areas of their own interest. They are models for and teachers of their peers. They become independent learners with abilities that enable them to become skillful problem-solvers.

The Parent Involvement Component

The TEEM Parent Involvement Component has developed a specific program for parents that includes four goal areas. Within each of these areas, specific skills and objectives were identified, materials were designed, and training was conducted, with all efforts being directed at developing a working interrelationship between the home and school in the following goals of Follow Through program operation.


b. Classroom Participation—with positive communication between parents and Local Education Agency; and guided classroom observation and participation.

c. Home-School Contacts—with positive communication between home and school; and communication between parents within the community.
d. **Parent-Developed Activities**—that provide for parent interests; for workshop activities; and for parents' participation in evaluations.

The specific skills parents need to achieve progress in the above goal areas are identified within the following competency areas: 1) Knowledge and Identification; 2) Planning and Development; 3) Implementation Procedures; 4) Recording and Documenting; and 5) Assessment and Evaluation. Since 1973, technical assistance and training for achieving these skills has been available to the Follow Through staff and Policy Advisory Councils.

APPENDIX B

THE TUCSON EARLY EDUCATION

MODEL IMPLEMENTATION INVENTORY
ARIZONA CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT
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TEEM IMPLEMENTATION INVENTORY

TEEM Staff
Revised 1979

This project was supported by a grant from the U.S. Office of Education, Follow Through Division, to the Arizona Center for Educational Research and Development, for the purpose of implementing and evaluating the Tucson Early Education Model in 19 school districts. The opinions expressed do not necessarily reflect the policy of the U.S. Office of Education and official endorsement should not be inferred.
TEEM IMPLEMENTATION INVENTORY

This checklist is intended to list a number of the aspects found in the ideal TEEM classroom on a typical day. Although it is not intended to cover all the aspects of TEEM, the list should include the more important facets of the included categories. All items are intended to be observed in the typical day in the classroom in which the TEEM program is implemented. That is, if a teacher is implementing the TEEM program, she is doing or promoting what is included in this list.

The list is not inclusive, nor is it evaluative. It does not include all the things a teacher does. It does not provide for evaluation of how well a teacher does her job. Its purpose is to describe the implementation of the TEEM program, not to evaluate teacher effectiveness.

The following categories are included:

I. Curriculum
II. Staff Planning Time
III. Physical Setting
IV. Whole Group Planning and Discussion Time
V. Committee Time
VI. Child Selection Time
VII. Eating Time
VIII. Physical Activity Time
IX. Whole Group Activity Time
I. CURRICULUM

Curriculum encompasses all activity of children within the school day. Children's experiences are the core of this curriculum and provide teachers with the means for relating children's individual development to development of classroom activity.

Language development, development of intellectual skills, motivation for learning, and the societal arts and skills provide the framework for planning, implementing, and evaluating classroom activity. The teacher accounts for and extends all of these areas of development within each activity setting, thus providing "orchestrated" learning settings for children.

The traditional subject areas (reading, writing, mathematics) are developed within a "process curriculum" orientation. How one learns is viewed as basic to developing what one learns. Emphasis throughout all activities, therefore, is on the process of learning.

There is a need for the understanding that play is a dynamic form of learning involving at once, in an integrated sense, intellectual, social, and physical skills. The distinction between work and play reflects traditional considerations that have no application in terms of child development. Clarification appears necessary in that the conditions for the occurrence of play have no singular time or position such as "outside." Play, whether indoors or out, provides as much opportunity for total development of the child as any activities described
as "work." The conditions which describe play are the conditions which
describe any learning environment.

See "Record Keeping," K. Cloud, R. Frasier, and E. Oursler, and
"Record Keeping," C. Rubow; both are included in the EPDA Summer
Training Notebook, 1972. See also "Professional Response," C. Rubow
I. Curriculum

Y - N 1. A variety of instructional materials are used as a resource for learning as opposed to one predetermined sequenced text.

Y - N 2. Activities provide for all children to use and develop language skills, intellectual skills, motivation for learning, and societal arts and skills.

Y - N 3. There is some evidence that the child's ideas and language form the basis for developing reading and writing activities.

Y - N 4. Children's recorded language is used as one resource for developing reading and writing skills.

Y - N 5. Children read a variety of resource materials (invitations, books, magazines, books written by other students, etc.).

Y - N 6. Each child is encouraged to do personal writing or dictating in some form each day.

8. The following options for children's activity are provided for within each instructional setting:

Y - N a. Different ways to approach the task.

Y - N b. Variety of materials and equipment.

Y - N c. Range of difficulty of the activity.

Y - N 9. Records are kept to record progress and needs of the children.

Y - N 10. Only positive references to minority groups are made by adults.

Y - N 11. In interacting with children, the adults use the professional response.

Y - N 12. All adult remarks avoid belittling a child.

Y - N 13. Play is utilized as a method of learning inside as well as outside the classroom.

Y - N 15. There is evidence that math skills (addition, subtraction, multiplication, division) are taught in functional manner within the process curriculum of TEEM. The skills are presented within the context of a variety of activities.

Y - N 16. The sequential nature of experiences with numbers is obvious, e.g., measuring experiences are progressively more encompassing and build on previous learning.

17. The teacher's verbal interaction with children is consistent in regard to raising the level of children's verbal language.

Y - N a. The teacher provides settings to stimulate verbal interaction among children.

Y - N b. The teacher models language such as question asking.

Y - N c. The teacher uses open-ended questions to stimulate curiosity.

Y - N d. The teacher uses corrective feedback to model language when needed.

Y - N 18. There is development of sight words drawn primarily from children's language which takes the form of talking murals; word walls; word banks; individual word books; word lists by topic, function, or alphabet; word games such as Lotto, etc.

19. There is evidence of phonetic and structural analysis skills being developed by the teacher through the use of teacher-made or child-made materials which:

Y - N a. Use the children's language as a basis of instruction.

Y - N b. Identify sound-symbol associations.

Y - N c. Present a sequence which allows for consonant and vowel substitution and word building.

Y - N d. Include a range of phonetic elements in a variety of reading materials to meet the needs of children's reading levels.

Y - N 20. Children are involved in a role of leadership and responsibility in classroom management activities.
II. STAFF PLANNING TIME

Participation of all adults working in the classroom in a daily planning session is vital to adequate implementation of TEEM. The teacher-teacher assistant team is the core of the planning session, working at regular intervals with a program assistant.

Parents and other volunteers will also participate in planning sessions in order to more knowledgeably interact with children in the learning environment.

Planning gives direction to all involved in the classroom operation so that interaction of children and adults facilitates a continuum of growth and development. One day builds on the next, builds on the next, etc. Based on specific knowledge of children's growth as related to the four goal areas, activities are planned to extend, facilitate and reinforce previous growth, thus providing a continuity of learning experience.
II. Staff Planning Time

Y - N 1. One hour daily is set aside for staff planning and assessment.

Y - N 2. All adults who are to be in the classroom tomorrow are in the planning session today (others may attend).

Y - N 3. Discussion includes a review of children's behavior in relation to TEEM goal areas.

Y - N 4. Discussion of children's experiences in and out of the classroom is related to the development of future classroom activities.

Y - N 5. Records of children's behavior and/or products are referred to during the planning session.

6. The discussion covers classroom activity in terms of goals, including:

Y - N a. Effectiveness of activities and materials.

Y - N b. Role of adults in learning environment.

Y - N c. Records kept of children's work.

Y - N d. Clarity of invitations.

Y - N e. Effectiveness of physical setting.


7. The above review of children's behavior and activity leads to selection of:


Y - N b. Materials and equipment (AV media, cookware, etc.).

Y - N c. Organization of the classroom for the school day: whole group planning and discussion time, committee time, free choice time, outdoor play and snack time.

Y - N d. Definite roles for all adults in learning activities.

Y - N 8. Learning objectives are individualized based on observed needs of individual children (e.g., math goals are developed, in part, based on an assessment of each child's ability to conserve quantity, area, volume, etc.).
Y - N 9. All planning session participants contribute information and/or suggestions during the planning session.

Y - N 10. Some record of the planning session is kept.

Y - N 11. Before the session concludes, the important decisions are summarized.
III. PHYSICAL SETTING

The way an environment is arranged affects how a child learns. The physical setting, therefore, is viewed as a vital part of the instructional program.

Learning becomes more meaningful as the child contributes to the development of the classroom environment.

The environment provides the motivation to become involved in learning activities as well as the means for such involvement.

An interest center (i.e., housekeeping, library corner, game center, etc.) is a physical area in a classroom which remains stationary throughout the day and may be used during either committee time or child selection time. An interest center is not synonymous with a committee setting. Interest centers represent an aspect of organizing a classroom, while committee time is a way of organizing children.
III. Physical Setting

Y - N 1. Child-sized tables and chairs are arranged to facilitate small group settings. Enough space separates all group settings so that children and/or adults can move between settings. Seven or fewer chairs are located at each table.

Y - N 2. There is room for the whole group of children to assemble in one area of the classroom.

Y - N 3. A variety of materials are visible and accessible for children's use.

Y - N 4. Children's work is displayed so children can see and use it.

Y - N 5. Children's language is displayed so that children can see and use it.

Y - N 6. Some materials relate to the children's experiences in the home and community, reflecting the uniqueness of these children's:

Y - N a. Community setting (i.e., local natural resources, industry, landmarks).

Y - N b. Cultural environment (i.e., cooking utensils, library, books, language, pictures, food served).

Y - N 7. Books written by the children are included in the classroom library or book center and are easily accessible to children.

Y - N 8. Storage space is provided for children's things -- in a place where children can get their materials without causing other children to move or pause in their activities.

Y - N 9. There are at least four interest centers (i.e., housekeeping, library corner, game center, etc.) which remain stationary throughout the day and may be used during either committee time or child selection time.

Y - N 10. There are at least two more interest centers than are utilized at any one time as committee settings.

Y - N 11. Over a period of time, interest centers are varied and/or replaced.
IV. WHOLE GROUP PLANNING AND DISCUSSION TIME

The planning, implementation, evaluation cycle allows development of an environment that adequately facilitates growth and development of children. Active involvement of the child in that cycle is basic to TEEM implementation.

As the child plans and evaluates with the teacher he is involved in setting up and assessing expectations for his own behavior and commits himself to active participation in the learning environment. This planning also allows children to participate in the development of a systematic approach to learning activity. The learning environment thus becomes cooperatively initiated by adults and children. This cannot happen unless the teacher encourages dialogue with children and between children. Direct questions requiring exact answers will preclude cooperative planning with children.

Whole group activity time should never be confused with whole group planning and discussion time. Whole group planning and discussion time is designed to facilitate planning with children for organizing activities. Whole group activity time is designed to make efficient use of resource persons, materials, and equipment that are limited in terms of availability.

Whole group planning and discussion time may consist of several short sessions during the day or of one session (e.g., last activity of the day to plan for tomorrow).
IV. Whole Group Planning and Discussion Time

Y - N 1. The teacher brings the children together as a whole group for planning, discussion, and evaluation.

2. Total time for planning and discussion time (not necessarily all in one session):
   Y - N a. is approximately 20 to 30 minutes for younger children.
   Y - N b. is less than 45 minutes for older children.

Y - N 3. The children (as a group) talk as much as the teacher during planning time.

Y - N 4. The teacher expands upon children's comments and uses these as a basis for further discussion and planning.

5. About half of the period is taken by each of the following:
   Y - N b. Teacher dialogue with child (or children).

Y - N 6. Over a period of time (say three days) each child talks during whole group planning and discussion time.
   (At least ____ different children talked today.)

Y - N 7. The teacher describes, reviews or develops with children activities for part or all of the day.

8. Children respond verbally to the activity discussion by:
   Y - N a. Asking questions.
   Y - N b. Suggesting extensions for previous committee activity.
   Y - N c. Indicating preferences.
   Y - N d. Suggesting changes.

Y - N 9. All children are physically in the group most of the time.

Y - N 10. The teacher permits movement within the group and allows a child temporary solitude outside the group if the child so desires.
V. COMMITTEE TIME

Children differ in their style of learning, the rate at which they learn, and what they learn from participation in a particular activity.

Organizing children into small groups allows for more individualized attention to children's growth and development. It further allows children to develop and generalize knowledge and skills to a variety of behavioral settings. Peer interaction in a heterogeneous setting provides opportunity for peer modeling and peer teaching.

Open-ended activities which provide for a range of activity based on the range of children's style and rate of learning provide for increased acceptance of the child as a successful learner. Options¹ and varying degrees of skill sophistication in children should be provided for in each instructional setting.

V. Committee Time

Y - N 1. Each day there is time provided for committee work.

Y - N 2. The kind of activity or options provided for should be compatible (e.g., noise level of activities, utilization of space, etc.).

3. Rotation from behavioral setting to behavioral setting is smooth:

Y - N a. Children are given time to clean up after activity, if necessary, before signaled to rotate to next committee.

Y - N b. Child knows when and where to move during committee work.

Y - N c. Individual and/or small group activity is provided for children who complete committee activity before rotation time.

Y - N d. Child can complete the activity or is told the activity can be continued at a later time.

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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>4. There are no more than 6 children in a group.</td>
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<td>Y - N</td>
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<td>6. There is a written invitation at each setting that:</td>
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<td>a. is communicative, as evidenced by children followed planned activity.</td>
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<td>b. is complete—choices and expectations are listed (if necessary).</td>
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</table>

7. The materials at each setting:

a. Allow children to follow planned activity.  

b. Are appropriate to planned activity so that each child can actively participate.  

c. Allow each child to make a choice.  

8. Each activity is individualized as evidenced by:

a. Variations in approach to activity, e.g., writing, drawing, dictating, cutting out, etc.  

b. Variations in content of children's productions, e.g., draw fish, people, birds, etc.  

c. Variations in skill sophistication, i.e., qualitative differences in outcome.  

9. Each committee activity develops:

a. Language  
<table>
<thead>
<tr>
<th>Committee</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
</table>
VI. CHILD SELECTION TIME

Child Selection Time facilitates development of decision-making skills in that children are allowed to select from a number of activities. The environment thus provides honest choices for children based on their interests and needs. Careful observation of children provides necessary information about children's growth and development. This information thus becomes the base from which activity options are developed.

Child Selection Time may be used to help the child develop commitment to a task. In this case, Child Selection Time could allow the child to choose an activity for the duration of participation time but not to change the activity until time is expired.

The range of activities planned by the teacher and children allow children to generalize concepts and skills from one behavioral setting to another such that learning is reinforced and thus becomes more useful to the child. This organization of activities should be developed during the Whole Group Planning and Discussion Time.
VI. Child Selection Time

Y - N 1. During at least one period each day every child is given an opportunity to choose an activity.

Y - N 2. Children are able to select from a variety of activities:
   a. At least three different activities are choice options for younger children, or
   b. More than three different activities are choice options for older children.

Y - N 3. Each child actively participates in the activity(ies) selected.

4. Each child selects an activity option based on information made available by the teacher.

Y - N a. The number and variety of options available for selection.

Y - N b. The number of children who may participate in any of the activity options.

Y - N c. What options may extend beyond the physical limits of the classroom.

Y - N 5. Essential supplies and materials are available at locations of the activities.

Y - N 6. Over a number of days each child varies selection of activities.

Y - N 7. Records of some children's activity choices are kept by teachers and/or children.

Y - N 8. Activities are appropriate for the time allotted as evidenced by the fact that the child can complete the activity or is told that the activity can be continued at a later time.

Y - N 9. The adults actively participate with children or observe and record children's behavior.
10. Each activity encourages development of:

<table>
<thead>
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<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Language</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>b. Motivation for Learning</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>c. Intellectual Skills</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>d. Societal Arts and Skills</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>
VII. EATING TIME

Eating Time allows opportunity to (1) involve children in responsibility for routines (i.e., serving of food, washing hands, preparing tables, etc.), (2) stimulate language as children and adults are allowed to interact with one another in a casual table manner, (3) observe children as they socially interact with one another, and (4) provide a variety of tasting experiences which may extend and expand growth in all of the four program goal areas.

Health habits are easily modeled and taught during this phase of the school day.

Tasting time as an activity in Committee Time does not constitute Eating Time, as all students participate in Eating Time daily. Eating Time must occur in the classroom, or as a class activity outside.

When tasting time is used as a committee activity, all the items in this category should apply.
VII. Eating Time

(Eating time refers to any time during the day when food and/or drink are served to the children.)

Y - N 1. Eating time occurs at least once during the day.

Y - N 2. Children's conversation is encouraged at eating time.

Y - N 3. Adults and children exchange friendly conversation at eating time.


5. Adequate storage of food is provided to ensure good food preservation habits:

Y - N a. Juice is freshly opened.

Y - N b. Food is covered until served.

Y - N c. Food is stored and placed away from contaminating materials.

6. The routine models good sanitary methods:

Y - N a. Hands are washed before eating.

Y - N b. Clean up procedures are routine.

Y - N c. Adult modeling especially evident in cleanliness.

Y - N 7. Over a period of time, a variety of food products allow children to explore new foods and unusual form of familiar food.

Y - N 8. Language development is stressed at eating time, as evidenced by discussion of taste, appearance, and preparation of new foods.
VIII. PHYSICAL ACTIVITY TIME

Physical Activity Time is viewed as one phase of the total learning environment. This segment of the school day is focused on extending growth as defined by the four program goal areas.

Adults assume a variety of active roles during this phase of the school day—observer, modeler, planner, facilitator, evaluator.

The outdoor environment is preferred as it invites children to select from a number of choices for activity. Activities may encourage active or quiet play; group or individual play; involvement with a variety of materials (e.g., sand, water, paint, blocks, wheel toys, balls, etc.), games with rules, free running games or use of a variety of climbing apparatus. The emphasis is on variety and choice which necessitate observation and interaction on the part of the adult.

The outdoor playground and the gym should be seen as extensions of the classroom where intellectual, social, and physical skills are developed. Thus, physical activities can be included as options in committee time and child selection time. Physical education should be planned according to the needs of individual children to the same extent that any societal art or skill is planned.
VIII. Physical Activity Time

Y - N 1. Some time is allotted for physical activity (not all children need to participate in these activities at the same time).

2. That physical activity has been planned is evident by:

Y - N a. There are two or more activity options for cooperative games.

Y - N b. Essential equipment is available for activities.

Y - N c. All children are physically active in some activity.

Y - N 3. The teacher and teacher assistant accompany children (teacher preferred if only one adult goes), and:

Y - N a. Actively participate in children's play, or


Y - N 4. The teacher and/or teacher assistant model physical skills, use of equipment and materials for the development of skills, and proper language.
IX. WHOLE GROUP ACTIVITY TIME

Although this phase of the school day is not an essential part of TEEM, it is important that teachers are aware of the possibility of using a whole group time for special activities. Music, storytelling, drama, are examples of activities that may be conducted within a whole group setting.

Whole Group Activity Time, if used, will serve to complement the greater portion of the school day in which children are working in individual or small group activities. When teacher and teacher assistant each take a part of the group, the following considerations apply to each group.

Y - N 1. During Whole Group Activity Time, such activities as music, sharing, storytelling or story reading, viewing movies or television programs may take place.

Y - N 2. The total time devoted to Whole Group Activity Time within the classroom each day is less than 45 minutes. (It does not have to occur at all and, if used, no one period exceeds 30 minutes. It terminates earlier when children are not attending.)

3. Any whole group activity is incorporated with other activities:

Y - N a. Children have been introduced to the activity and know why they are participating.

Y - N b. Major topics are discussed and/or followed up in Committee Time or Child Selection Time.

Y - N c. Adults participate in Whole Group Activity Time as models and instructors.

Y - N 4. The teacher permits movement within the group and allows a child temporary solitude if the child so desires.
APPENDIX C

COMMUNITY IMPLEMENTATION OF TEEM OBJECTIVES

FOR LANGUAGE ARTS AND READING

The following objectives were taken from the TII Curriculum Section. These objectives detail the unique aspects of TEEM's reading and language program. Percentages indicate the degree of implementation of TEEM within the third-grade FT classrooms in the community in which this study was done.

1. A variety of instructional materials are used as a resource for learning as opposed to one-predetermined sequenced text. 80%

2. Activities provide for all children to use and develop language skills, intellectual skills, motivation for learning, and societal arts and skills. 100%

3. There is some evidence that the child's ideas and language form the basis for developing reading and writing activities. 60%

4. Children's recorded language is used as one resource for developing reading and writing skills. 80%

5. Children read a variety of resource materials (invitations, books, magazines, books written by other students, etc.). 60%

6. Each child is encouraged to do personal writing or dictating in some form each day. 100%

19. The teacher's verbal interaction with children is consistent in regard to lifting the level of children's verbal language.

   a. The teacher provides settings to stimulate verbal interaction among children. 80%

   b. The teacher models language such as question-asking, elaboration, extension, expansion, and alternatives. 60%

   c. The teacher uses corrective feedback to model language when needed. 40%
d. The teacher uses open-ended questions to stimulate curiosity. 50%

20. There is continuous development of sight words drawn primarily from children's language which takes the form of talking murals; word walls; word banks; individual word books; word lists by topic, function, or alphabet; word games such as Lotto, etc. 100%

21. There is evidence of phonetic and structural analysis skills being developed by the teacher through the use of teacher-made or child-made materials which:

a. use the children's language as a basis of instruction;

b. identify sound-symbol in a variety of ways; and

c. present a sequence which allows for consonant and vowel substitution and word building. 100%
APPENDIX D

CHILDREN'S LANGUAGE ASSESSMENT--
SITUATIONAL TASKS MANUAL
This summary was prepared to accompany a presentation at Session 5.07 of the 1976 Annual Conference of the American Educational Research Association.

The research reported in this paper was supported by a grant from the U.S. Office of Education, Follow Through Division, to the Arizona Center for Educational Research and Development, for the purpose of implementing and evaluating the Tucson Early Education Model in 19 school districts. The opinions expressed do not necessarily reflect the policy of the U.S. Office of Education and official endorsement should not be inferred.
The Children's Language Assessment—Situational Tasks was developed to collect language samples within a normally operating classroom. The language is taken on a cassette tape recorder which is placed at the foot of a small table. At this table, in a committee setting, four children are engaged with a teacher in an activity similar to those they encounter daily. The Children's Language Assessment—Situational Tasks is broken into three segments: the first, with their own classroom teacher, utilizes a "mystery bag" containing 27 common household objects (15 minutes); the second, with a new adult (a staff research assistant), uses a set of eight picture cards that have no set solution (15 minutes); in the third, the children are left alone (five minutes), with the tape recorder running, while the adult excuses herself briefly.

These three segments are intended to get different perspectives on children's language development. The first, with a familiar teacher, should resemble very closely children's typical use of language in the classroom. The second segment assesses whether their language style is modified in the presence of an unfamiliar adult. During Task II (new adult), the adult uses only a limited set of prompts to reduce spurious influences on the children's language. The third segment seeks to simulate other studies of natural language, and the children are left alone with the cards from Task II and the tape recorder running.
The tapes are returned to the Arizona Center for transcription and analysis. The information is first broken down into free flow format which identifies teacher and child output. These are then submitted to an analysis for basic language dimensions.

**Description of Procedure**

**CLA-ST: Session 1**

This session is designed to assess ongoing classroom teacher-child and child-child interactions. Data are gathered within the instructional setting with a group of three children working with their own classroom teacher. Teacher input is unstructured, but the length of the session is controlled.

A tape recorder and microphone are set up in the classroom and the classroom teacher is provided with a bag of common objects (Appendix A). The following instructions are given to the teacher:

In this bag is an assortment of common objects. We would like you to use these materials with three of your pupils that we will select. You are free to use the materials in any way you like to elicit language from your children. We would like you to conduct your teaching session around this table. We will tape record your session. We will alert you when the 15 minutes are up. Do you have any questions?

**CLA-ST: Session 2**

This session is designed to gather language in a structured situation somewhat analogous to a typical testing situation. Three randomly selected classmates are brought to a quiet room separate from their classroom. The stimulus materials are eight laminated, colored cartoon cards depicting a humorous fight between two men. Possible
sequencing of the eight cards is highly varied and intentionally ambiguous (see Appendix B). The "teacher" is a research assistant and unknown to the children. She asks the group of children structured questions about randomly selected, specified cards. In the first five-minute phase the "teacher" presents cards singly and, allowing time for responses, asks two questions: "What is happening in this picture?" and "Is there anything you want to ask about this?". Presenting two cards at a time in the second phase, the "teacher" asks two questions: "Which picture comes first? Why?" and "What happened after this card?". In the final five-minute phase the "teacher" presents three cards at a time and asks: "What story do these pictures tell?" and "How could you change these cards to tell a new story?". Like Session 1, the total time of this session is fifteen minutes.

CLA-ST: Session 3

This session is included in data collection as a sample of children's free, spontaneous speech. At the completion of Session 2, the "teacher" advises the group: "I have some work to do, but you can continue to play with the cards while I do it." Depending on the school's regulations, she then leaves the room or removes herself to another part of the room and turns her attention away from the children. The group of three children is left with the stimulus cards and with the tape recorder operating for five minutes. The adult does not interfere, except in case of potential damage to the children or equipment.
Data Analysis

Tape recordings of the language samples are transcribed and coded by a team of five research assistants. A consensus method of reliability is used by the research staff for the transcription of the tape recordings. After transcription, a tape recording is listened to a second time by another research assistant, and points of contention are resolved by consensus. Twenty percent of each staff’s coding is recoded by another assistant. The resulting reliability for all language variables was 94 percent, with a range of 89 percent to 100 percent.

The coding yielded data on eleven language analysis variables. These variables are described in Table 1.

INSERT TABLE 1

The only language analysis variable indicating quantitative differences in language output is the average number of words per child. Sometimes used as a measure of linguistic development, the number of words per unit of time is sensitive to situation demands. Although the total length of the sessions was controlled (e.g., fifteen minutes each in Sessions 1 and 2; five minutes in Session 3), the average number of words per child in Session 1 reflects either the relative amount of talking by teacher or by children, or the ease of talking freely in group situations, or both. In Session 2, the amount and content of adult input was controlled, but the children were in a new situation with an unknown adult. Cross-session comparisons on this variable can be made only with consideration of these situational demands.
Three variables provide data on linguistic diversity in oral speech: type-token ratio, verb tense diversity, and vocabulary diversity. A type-token ratio is the ratio of the number of different words (types) to the total number of words (tokens). High type-token ratios indicate more linguistically diverse speech than do lower ratios. The use of a few words frequently as opposed to larger variety of words would yield a low type-token ratio. One problem with type-token ratios is that the ratio will decrease as the sample size increases because fewer and fewer of the words will not have occurred in the samples already counted. To make the ratios independent of sample size, the number of different words (types) was divided by the square root of twice the number of words in the sample (Carroll, 1964, p. 54). A measure of verb tense diversity is provided by the ratio of present tense verbs to total verbs. The lower a verb diversity ratio is, the more a child used past and future tense verbs. A second measure of vocabulary diversity in addition to the type-token ratio is the frequency of words used that do not appear on the Dolch Vocabulary List. Words on this list are those commonly found in primary grade reading primers. A frequency count of words in a child's lexicon other than those on this list can be interpreted to assess richness of vocabulary.

Syntactic performance in the language samples was assessed by four variables: number of complete T-units, average length of T-units, percentage of complex T-units, and frequency of child-initiated questions. A T-unit is defined as the simplest part of a sentence that can stand alone, together with any subordinate clauses that may be grammatically related. Considering the unique linguistic demands of conversation, a
T-unit can be grammatically incomplete, a simple sentence, or a complex sentence. The frequency of child-initiated questions is a program-specific goal and reflects interest in children's acquisition of generative skills.

Task II data was also analyzed for the frequency of assignments of words to cartoon characters. This was included as a measure of ease of narration and/or as a qualitative narrative skill. During the session in which peers are without a controlling adult, a measure of task-oriented conversation was generated by a ratio of the number of task-specific utterances over the number of total utterances.
TABLE 1
Language Analysis Variables for the CLA-ST

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Output</td>
<td>Average number words per child</td>
<td>Total number of child words per session divided by the number of children in the group (3).</td>
</tr>
<tr>
<td>Linguistic Diversity</td>
<td>Type-token ratio</td>
<td>Number of different words (types) divided by the total number of words (tokens); yields a measure of vocabulary size.</td>
</tr>
<tr>
<td></td>
<td>Present verbs/total verbs</td>
<td>Number of present tense verbs divided by the total number of verbs; provides a measure of diversity of verb tense usage.</td>
</tr>
<tr>
<td></td>
<td>Words not on Dolch Vocabulary List</td>
<td>Frequency of words used by children that are not on the Dolch Vocabulary List; another method of measuring vocabulary size.</td>
</tr>
<tr>
<td>Syntactic Performance</td>
<td>Number of Complete T-units</td>
<td>Frequency of complete T-units, or the simplest part of a sentence that can stand alone, together with any subordinate clauses that may be grammatically related; considering the unique demands of conversation, a T-unit can be grammatically incomplete, a simple sentence, or a complex sentence.</td>
</tr>
<tr>
<td>Category</td>
<td>Variable</td>
<td>Explanation</td>
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<tr>
<td>--------------------</td>
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<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Syntactic</td>
<td>Percentage of complex T-units</td>
<td>The number of complex T-units divided by the number of complete T-units.</td>
</tr>
<tr>
<td>Performance</td>
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<td>(continued)</td>
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<td>(continued)</td>
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<tr>
<td>Child-initiated</td>
<td>Frequency of questions from a child directed to peer or adult.</td>
<td></td>
</tr>
<tr>
<td>questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Assignments of words to cartoon characters</td>
<td>In the second session only: the frequency of direct or indirect quotes where a child provides words for a cartoon character.</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>Task-specific/total utterances</td>
<td>In the peer only session: number of child responses concerning playing with the cards (their task as stated by the adult) divided by the total responses in the session.</td>
</tr>
</tbody>
</table>
APPENDIX A

Contents of Session I

"Mystery Bag"
Plexiglass
Chain
Brush
Rubber band
Velvet ribbon
Eraser
Sponge
Candle
Wire
Bottle cap
Green washer
Paper clip
Button
Piece of metal
Red "pop" bead

Purple "pop" bead
Shell
Sandpaper
Green thread
Portion of egg carton
Battery
Ruler
Mitten
Marshmallow
Pencil
Black plastic ring
Nail

3 pipe cleaners (orange, white, yellow)
Orange balloon
2" brad
APPENDIX B

Stimulus Cards Used

in Session II
APPENDIX C

STIMULUS CARDS USED IN PARALLEL-FORM

RELIABILITY OF SESSION 2
APPENDIX E

PRODUCTIVE LANGUAGE ARTS TASKS

EXAMINER AND SCORERS MANUALS
The High/Scope Productive Language Arts Test is designed to evaluate the written language production of children in a relatively unstructured situation. The test comprises two separate writing tasks: Reporting and Narrating. In the Reporting task, each child is given materials with which to make something of his/her choice. After working with these materials for twenty minutes, children are asked to write about how they made whatever they made. In the Narrating task, each child is given a standard set of materials to use in making up a story. After a period of free play with these materials, children are asked to write a make-believe story.

GENERAL INSTRUCTIONS

Instructions for both tasks are contained in this manual. Throughout the manual, what you are to say to the child is in UPPER CASE and what you are to do is in lower case. Keep the manual with you and open to the appropriate page during the entire time that you are testing.
Scheduling Tests

Children should be tested in groups of no more than six at one time. The same child should not be given both tasks on the same day. Each task takes less than one hour to administer.

Test Preparations

Before testing a group of children, Child Identification Forms (except for examiner's comments) should be completed for each child and writing booklets should be prepared for each child with his/her name printed in the top right hand corner on the first page.

In addition, the following materials should be ready:
Narrating or Reporting kits
Sharpened pencils
Extra paper for children to copy stories or draw
Felt tip pens
Sign reading "Once upon a time" (Narrating task only)

The testing room should be relatively quiet and carpeted if possible. There should be enough chairs and table surface for six children to be able to work comfortably with materials and write their stories (approximately 10 square feet of table surface per child).

Examiner's Role

While the children use materials and write their stories, you should sit where you can see and hear each child, but not so close as to distract them. Do not interact with children or talk to them unnecessarily while they work.
Helping

You may repeat instructions for a task at any time at a child's request.

If a child asks what something is, say:

WHAT DO YOU THINK IT IS?

YOU GIVE IT A NAME.

If a child asks how to do something with materials or for help in doing something with materials (other than using tape dispenser, taking cap off magic marker, or the like), say:

WHY DON'T YOU TRY TO THINK OF YOUR OWN WAY (or ANOTHER WAY) TO DO IT?

Only if asked should you give help with spelling and punctuation. Refrain from helping in any other way. Do not offer suggestions about solving problems in writing or working with materials.

Management

While working with materials, children are expected to interact with one another, but if one child disrupts the work of another, say:

I THINK YOU'D BETTER WORK WITH YOUR OWN THINGS.

In some instances, it may be necessary to separate two children. While writing, if children become involved in a conversation not related to the task, say:

NOW IS THE TIME FOR ALL OF US TO WRITE STORIES. WE CAN TALK ABOUT OTHER THINGS WHEN WE ARE FINISHED.

If a child disrupts testing after he/she has finished writing, he/she should be moved from the table to another part of the room until
testing is completed.

In extraordinary circumstances, a disruptive child may be returned to his/her room.

Examiner's observations

If you feel that the test of a particular child is invalid and should not be used, you should provide an explanation in the space provided for examiner's comments on the Child Identification Form. If a child is obviously sick or emotionally distraught, he/she may return to his/her classroom at your discretion and be retested on another day if possible.

Completed Tests

At the end of each session, each child's writing sample should be stapled to his/her Child Identification Form and carefully filed.

At the end of each testing day, the list of children to be tested on Reporting and Narrating tasks should be updated by noting which children have received which tasks. If possible, completed tests should be filed with the Project Director daily in order to minimize loss.

When all tests have been completed, test kits and class lists should be returned to the Project Director.

Test Materials

Reporting Task (1 set per child)

Raw Materials

1. One cotton ball
2. Five 4" x 4" sheets of paper
   - two sheets of white construction paper
   - two sheets of yellow construction paper
   - one sheet of cream tag board

3. Two 4" x 2" sheets of paper
   - one sheet of cream tag board
   - one sheet of white construction paper

4. Two triangular sheets of paper cut from 4" x 4" squares
   - one cream tag board
   - one yellow construction paper

5. One 4" x 4" sheet of crepe paper

6. One 4" x 4" piece of red double knit fabric

7. One 4" strip of blue perforated plastic ribbon

8. One 4" x 4" sheet of 1/2" thick plastic foam

9. Six white pipe cleaners of two diameters and four lengths
   - two 6" lengths, one large and one small diameter
   - two 3" lengths, one large and one small diameter
   - one 4" length, small diameter
   - one 2" length, large diameter

10. Six paper fasteners of three sizes
    - two #2
    - two #4
    - two #6

11. One rubber band (#16)
Tools (1 set per child)

1. One roll of cellophane tape in dispenser
2. One pair of scissors
3. Two broad-tip magic markers in different colors with water soluble ink

Narrating Task (1 set per child)

1. One cardboard box
2. One car
3. Five wooden figures
   - one six inches tall
   - one five inches tall
   - one four inches tall
   - two three inches tall
4. Twelve one-inch cubes
   - six of one color
   - six of another color
5. Two squares of felt
   - one blue
   - one gold
REPORTING TASK: SPECIFIC INSTRUCTIONS

(50 minutes)

Have materials, writing booklets, pencils, and materials list ready. Place materials list where all children can see it. Place tape dispensers, scissors, and felt pens where children can reach them.

Seat children around table and establish rapport. Then say:

I AM GOING TO GIVE YOU SOME THINGS THAT YOU CAN USE TO MAKE SOMETHING. YOU CAN MAKE ANYTHING THAT YOU WANT TO MAKE AND WHEN WE ARE ALL THROUGH YOU CAN TAKE WHAT YOU HAVE MADE BACK TO THE CLASSROOM WITH YOU.

Begin distributing packages of materials to each child and say:

PLEASE DON'T START YET.

After materials have been distributed, say:

I WANT TO MAKE SURE THAT YOU UNDERSTAND.

I WOULD LIKE YOU TO MAKE SOMETHING WITH THESE THINGS. YOU CAN MAKE ANYTHING YOU WANT TO MAKE. YOU CAN HELP EACH OTHER IF YOU WANT TO, BUT PLEASE USE ONLY YOUR OWN THINGS TO MAKE SOMETHING.

IN A LITTLE WHILE, I'M GOING TO ASK YOU TO WRITE A STORY ABOUT WHAT YOU MADE AND HOW YOU MADE IT.

Pause. Then say:

CAN ANYONE TELL ME WHAT WE ARE GOING TO DO?

Have at least two children repeat your instructions. If children are unable to repeat your instructions, you should reread them beginning at the * above. If directions are understood, say:
OKAY. YOU CAN BEGIN WORKING NOW. YOU CAN USE THE TAPE, SCISSORS, AND PENS TO HELP MAKE SOMETHING IF YOU WANT.

Begin timing. A maximum of 20 minutes is allowed for making something. Say:

YOU HAVE ABOUT TWENTY MINUTES TO MAKE SOMETHING.

Sometimes it is necessary to encourage or control individual children. You should move directly across from or alongside a child when addressing him/her individually.

1. If one child begins to use another's materials, say:

I'M SORRY, BUT YOU WILL HAVE TO USE ONLY YOUR OWN THINGS.

2. If a child does not begin working with the materials, say:

CAN YOU THINK OF SOMETHING TO DO WITH THESE THINGS?

or I BET THERE ARE A LOT OF THINGS THAT YOU CAN MAKE WITH THESE THINGS.

These prompts should be repeated until the child starts working.

3. If a child stops working before 15 minutes have passed, say:

IS THERE ANYTHING ELSE THAT YOU COULD DO?

This question may be asked only two times after which a child is assumed to have finished.

4. If a child indicates that he/she cannot finish making something without having more or different materials, say:

I'M SORRY, BUT YOU WILL HAVE TO USE ONLY WHAT YOU HAVE.

CAN YOU THINK OF SOME OTHER WAY OF DOING WHAT YOU WANT TO DO?

5. When a child has finished, give child blank paper and say:
MAKE A DRAWING OF WHAT YOU MADE UNTIL THE OTHER CHILDREN HAVE FINISHED WORKING.

When 10 minutes have passed, say to the group:

YOU HAVE ABOUT TEN MINUTES TO FINISH WHAT YOU ARE MAKING.

When 15 minutes have passed, say to the group:

YOU HAVE ABOUT FIVE MINUTES TO FINISH.

When 18 minutes have passed, say to the group:

NOW YOU HAVE ONLY TWO MINUTES TO FINISH WHAT YOU ARE MAKING.

When 20 minutes have passed say:

HERE IS A PENCIL AND SOME PAPER SO THAT YOU CAN WRITE A STORY ABOUT WHAT YOU HAVE MADE.

PLEASE WRITE AS MUCH AS YOU CAN ABOUT HOW YOU MADE IT. MAKE THE STORY SO CLEAR THAT ANOTHER CHILD COULD MAKE ONE JUST LIKE YOURS. I NEED TO HAVE THE BEST STORY YOU CAN WRITE.

Distribute pencils and writing booklets. Pick up tape, felt tip pens, and scissors. Leave the materials which the child has used to make something.

Make sure that you have children's attention and say:

CAN ANYONE TELL ME WHAT WE ARE GOING TO DO NOW?

Have at least two children repeat your instructions. If children cannot repeat your instructions, reread them beginning at the * above.

If instructions are understood, say:

THAT'S RIGHT. YOU SHOULD WRITE AS MUCH AS YOU CAN ABOUT HOW YOU MADE IT. HERE IS A LIST OF WORDS FOR THE MATERIALS I GAVE YOU. LET'S GO THROUGH THEM.
Read materials list.

YOU CAN BEGIN NOW. PLEASE DO YOUR VERY BEST.

Children are permitted to ask one another questions related to what they are writing. You are permitted to give help with spelling and punctuation when it is requested.

Begin timing. A maximum of 30 minutes is allowed for writing.

Sometimes it is necessary to encourage individual children. You should move directly across from or alongside a child when addressing him/her individually.

1. If a child keeps working with materials, say:

YOU CAN FINISH WHAT YOU ARE MAKING LATER.

2. If a child does not begin writing, say:

WHAT COULD YOU TELL ANOTHER CHILD ABOUT HOW YOU MADE THAT?

or HAVE YOU TOLD ME HOW YOU USED THE THINGS I GAVE YOU?

or COULD YOU TELL ME WHAT YOU DID SO THAT ANOTHER CHILD COULD MAKE SOMETHING LIKE WHAT YOU MADE?

These prompts should be repeated until the child starts writing.

3. If a child stops writing before 30 minutes have passed, encourage him/her to continue writing by saying:

IS THERE ANYTHING ELSE YOU CAN WRITE ABOUT HOW YOU MADE IT?

WHAT WOULD ANOTHER CHILD NEED TO KNOW TO MAKE ONE JUST LIKE YOURS?

This prompt may be repeated three times but no more than three times.

4. When a child has finished writing before 30 minutes have passed, say:
MAKE A DRAWING OF WHAT YOU DID UNTIL THE OTHER CHILDREN HAVE FINISHED WRITING THEIR STORIES.

Pick up child's writing booklet and find him a place to draw that is away from the other children, if possible.

When 10 minutes have passed, say:

YOU HAVE A LONG TIME LEFT TO WRITE ABOUT WHAT YOU MADE. HAVE YOU TOLD ME WHAT YOU DID SO THAT ANOTHER CHILD COULD MAKE SOMETHING LIKE YOU MADE?

When 20 minutes have passed, say:

YOU HAVE ABOUT TEN MORE MINUTES TO WRITE ABOUT WHAT YOU MADE. HAVE YOU TOLD ME HOW YOU MADE IT? HAVE YOU MADE THE STORY SO CLEAR THAT ANOTHER CHILD COULD MAKE ONE?

When 25 minutes have passed, say:

YOU HAVE FIVE MINUTES TO FINISH WRITING.

When 30 minutes have passed, say:

OKAY. I HAVE TO PICK UP YOUR STORIES NOW. IT'S TIME TO GO.

Allow one minute or so for children to finish. Pick up stories.

This completes the Reporting task.
NARRATING TASK: SPECIFIC INSTRUCTIONS

(45 minutes)

Have materials, writing booklets, and pencils ready.

Children are permitted to talk with one another and to share materials during the Narrating task.

Seat all the children in a circle on the floor and establish rapport. Put the sign with the words "Once upon a time" where all can see it. Begin by saying:

CAN ANYONE TELL ME WHAT A MAKE-BELIEVE OR PRETEND STORY IS?

Allow the children to respond until the concept is clear. When a child makes a relevant statement, repeat it for the group if possible. When the concept seems to be understood, say:

THAT'S RIGHT. A MAKE-BELIEVE STORY IS A STORY YOU MAKE UP.

SOMETIMES A MAKE-BELIEVE STORY BEGINS WITH THESE WORDS.

Point to the words "Once upon a time" and say:

CAN ANYONE TELL ME WHAT THESE WORDS SAY?

After someone responds, or if no one responds, say:

THE WORDS SAY "ONCE UPON A TIME."

* LATER I'M GOING TO ASK YOU TO WRITE A MAKE-BELIEVE STORY.

BUT FIRST, I'M GOING TO GIVE YOU SOME THINGS TO HELP YOU MAKE UP THE STORY. I'M NOT GOING TO TALK WITH YOU VERY MUCH WHILE YOU DO THIS. YOU CAN PLAY WITH EACH OTHER IF YOU WANT TO.

Pause. Then say:
CAN ANYONE TELL ME WHAT WE'RE GOING TO DO?

Have at least two children repeat your instructions. If the children cannot repeat your instructions, reread them beginning at the * above. If the instructions are understood, say:

TAKE A LOOK IN YOUR BOX AND SEE WHAT YOU HAVE.

Allow children a couple of minutes to take their materials out, and say:

NOW YOU MAY BEGIN TO USE YOUR THINGS. AFTER FIFTEEN MINUTES I'M GOING TO STOP YOU AND ASK YOU TO MAKE UP A STORY AND WRITE IT DOWN.

Begin timing. A maximum of 15 minutes is allowed for playing with materials.

Sometimes it is necessary to encourage individual children. You should move directly in front of a child at eye-level when addressing him/her individually.

1. If a child is not playing with the materials, say:

   LOOK AT WHAT (child's name) IS DOING. CAN YOU THINK OF SOMETHING TO DO WITH YOUR THINGS?

   or (picking up an object) WHAT DO YOU THINK THIS COULD BE?

   or (picking up an object) WHAT COULD YOU PRETEND THIS IS?

   These prompts should be repeated until the child begins playing. Other questions may be asked, but do not make direct suggestions about how a child might use the materials.

2. If a child stops playing with the materials before 15 minutes have passed, say:
IS THERE SOMETHING ELSE YOU COULD DO (or PRETEND)?

This prompt may also be repeated.

3. If a child is completely uninterested in playing with the materials any longer, you may take him/her over to the table with materials in their box and say:

CAN YOU TELL ME WHAT WE WERE GOING TO WRITE?
Allow time for response. Then say:

WRITE WHATEVER MAKE-BELIEVE OR PRETEND STORY YOU WANT TO WRITE. YOU MIGHT WANT TO BEGIN WITH "ONCE UPON A TIME."

After 10 minutes have passed, say:

YOU HAVE ABOUT FIVE MINUTES TO FINISH.
After 13 minutes have passed, say:

YOU HAVE TWO MINUTES TO FINISH.
After 15 minutes have passed, say:

OKAY, PUT ALL YOUR THINGS BACK IN THE BOX AND BRING THEM TO THE TABLE WITH YOU.
Materials should be left where the children can see them.
After the children are seated around the table, say:

CAN ANYONE TELL ME WHAT WE ARE GOING TO DO NOW?
Allow time for response. Then pass out writing booklets and pencils, and say:

WRITE WHATEVER MAKE-BELIEVE OR PRETEND STORY YOU WANT TO WRITE. YOU MIGHT WANT TO BEGIN WITH "ONCE UPON A TIME."
PLEASE WRITE THE BEST STORY YOU CAN.

Begin timing.
Sometimes individual children need to be encouraged. You should move directly across from or alongside a child when addressing him/her individually.

1. If a child does not begin writing, say:

   (Child's name) WRITE WHATEVER MAKE-BELIEVE STORY YOU WANT TO WRITE.

Prompt one time.

2. If a child does not begin to write after prompting (above) or if a child stops writing before 30 minutes have passed, encourage him/her to begin or continue writing by saying:

   IS THERE ANYTHING (MORE) YOU'D LIKE TO SAY IN YOUR STORY?

If the child still does not write, you should encourage him/her one more time. Do not encourage any child more than two times.

3. If a child finishes writing before 30 minutes have passed, say:

   WOULD YOU LIKE TO MAKE A COPY OF YOUR STORY FOR YOURSELF?

   I MUST KEEP THIS ONE.

Give the child a clean sheet of paper and a felt tip pen. If the child does not want to make a copy, say:

   MAKE A DRAWING OF WHAT YOU DID UNTIL THE OTHER CHILDREN HAVE FINISHED WRITING THEIR STORIES.

After 20 minutes, say:

   YOU HAVE ABOUT TEN MINUTES TO FINISH YOUR STORIES.

After 25 minutes, say:

   YOU HAVE FIVE MINUTES TO FINISH YOUR STORIES.
After 28 minutes, say:

YOU HAVE ONLY TWO MINUTES TO FINISH YOUR STORIES.

After 30 minutes, say:

OKAY. I HAVE TO PICK UP YOUR STORIES NOW. IT'S TIME TO GO.

Give children who are still writing a minute or so to wrap up.

Pick up stories.

This completes the Narrating task.
HIGH/SCOPE PRODUCTIVE

LANGUAGE ARTS TEST

SCORING MANUAL

1975 Field Test Edition

May 1975

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PART I
DEFINITION OF CATEGORIES FOR T-UNIT ANALYSIS

Reporting and Narrating Tasks

I. T-UNIT

A T-unit is a single independent predication (i.e., both subject and verb are contained) together with any subordinate clauses that may be grammatically related to it. It may be a simple or complex sentence, but not a compound sentence.

Example of T-units:

(1) (2) (3)
there lived an ant/he lived in woods/the ant was picking up food/

Guidelines to be Followed in the Analysis of T-units

1. Compound versus complex sentences. A complex sentence comprises an independent clause and any number of clauses which are subordinated to it. A compound sentence comprises two or more independent clauses which are linked by a coordinating conjunction. Complex sentences are considered to be a single T-unit. Each simple or complex sentence in a compound sentence is considered a separate T-unit.

   a. Adjective clauses are always subordinated to a main clause:
      The car that he bought does not run (1 T-unit; 8 words)

   b. Noun clauses are always subordinated to a main clause:
      I thought that it would work (1 T-unit; 6 words)

   c. Adverbial clauses are always subordinated to a main clause.
      Adverbial clauses of comparison are most commonly introduced by than:
A plane flies faster than a bird does (1 T-unit; 8 words)

Movable adverb clauses (Hunt, 1965) are introduced by subordinating conjunctions. A subordinating conjunction may be identified by applying this rule: a subordinator relates the clause immediately following it to another clause on either its right or left:

I'll go when I'm ready. = When I'm ready, I'll go. (1 T-unit)

Common subordinators include:

- after
- although
- as
- just as
- as if
- because
- before
- how
- if
- once
- except that
- even though
- like
- ever since
- different than
- since
- that
- so

so that

though
till

unless

until

when

where

whether

while

why

d. **Coordinating conjunctions**, **correlative conjunctions**, and **conjunctive adverbs** are used to coordinate one clause with another. A coordinating conjunction, or **coordinator**, always relates the clause which immediately follows it to the clause to its left even across a period (.) boundary.

A clause that is coordinated with another clause is sometimes subordinated to it as well. **If two or more clauses** connected
by a coordinator each has a subject, each clause is considered a separate T-unit (and the coordinator is associated with the clause which immediately follows it):

(1) (2)
I went to the pond/and I went fishing (2 T-units)

(1) (2)
Either he will win/or he will lose (2 T-units)

(1) (2)
Debbie went to church/then she went home (2 T-units)

However, if a clause following a coordinator does not have an expressed subject, it is considered a subordinate clause to the preceding T-unit:

I went to the pond but did not catch any fish (1 T-unit)

Debbie went to church then went home (1 T-unit)

Subordinate clauses occur frequently after a coordinating conjunction, occasionally after a conjunctive adverb (particularly "then"), and never after a correlative conjunction.

The conjunction "so" can function as either an introducer of adverbial clauses (see c above) or as a coordinating conjunction. When "so" can be replaced by "so that" without altering the meaning of the statement, it is an introducer of an adverbial clause and whatever follows it is considered a subordinate clause:

I made a house so (so that) I could live in it (1 T-unit)

(1) (2)
He saw a stranger coming/so he went in his house (2 T-units)
Common coordinators in each of the three categories are listed below:

**Coordinating conjunctions:**
and but for nor or so yet

**Correlative conjunctions:**
Either...or...
Neither...nor...
Not only...but (also)...
Whether...or...

**Conjunctive adverbs:**
anyhow furthermore namely
anyway hence nevertheless
besides however otherwise
consequently indeed still
accordingly likewise then
also (too) moreover therefore

3. When a dependent clause or phrase might be associated with either of two complete T-units, preceding and following it, the clause or phrase should be attached to the T-unit which precedes it unless punctuation indicates otherwise:

I started a fire *with a match*/I burned the paper up/ (2 T-u)
(The prepositional phrase "with a match" might be associated with the T-unit "I started a fire" or the T-unit "I burned the paper up." In this example, the phrase is attached to
the T-unit preceding it because there is no punctuation indicating that it was intended to be part of the T-unit which follows.)

2. **Attention claimers.** Attention claimers (O'Donnel, et al., 1967) will be considered part of the T-unit to which they draw attention:

   - Well, when he came back the dove came (8 words)
   - See there was a dove (5 words)

3. **Punctuation.** The writer's punctuation will be disregarded in the analysis since the identification of the T-unit depends upon grammatical features.

4. **Admissible deviations from standard grammar.** Correct verb tense and form of the pronoun as well as the absence of a helping verb or article will be disregarded in the determination of a complete T-unit.

   a. Incorrect verb tense:

      - The ant fall (fell) off and fall (fell) straight into the water. (10 words)

   b. Incorrect pronoun:

      - Then the ant left from he (his) house. (7 words)

   c. Missing helping verb:

      - As the ant (was) walking he got on a snail. (9 words)

   d. Missing article:

      - The ant was walking home with (a) big pill. (8 words)
5. **Elliptical constructions.** Elliptical constructions exist when normally "essential" grammatical elements are omitted from T-units without rendering the T-units grammatically incomplete. The missing elements do not render elliptical constructions incomplete because these elements are clearly implied by preceding T-units. Elliptical constructions are extremely common in conversation and written dialogue. Whenever a word string appears to represent a character or characters talking, discrete intelligible statements will be treated as independent T-units.

   (1) (2) (3)
   He said where are you going/What/Where are you going/
   (4) (5)
   Over there/Well go on then/ (5 T-units)

   (1) (2)
   Stop/he stopped and said okey/ (2 T-units)

When a character's statement is preceded or followed by "he/she said" (or equivalent), "he/she said" is associated with the statement as in the examples above and below:

Donna said well I want some/but I won't wait any longer/so give it to me/ (3 T-units)

(1) (2) (3)
the hunter shot the ant/and the ant yelled ouch/I'm sorry the hunter said/ (3 T-units)

6. **Decodable words.** Decodable words include all letter strings which can be reasonably interpreted as meaningful words. Specifically:

a. words which are correctly spelled and legibly written;

b. words which are phonetically spelled:

They had **deighsighns** (designs) on them. (5 words)
He got on a *snal* (snail) *sow* (so) he *whonot* (would not) *haft* (have to) *wake* (walk). (12 words)

The man came out from *(h)is* house. (7 words)

c. Words in which obvious letter reversals, substitutions, or truncations occur:

He went *ot* (to) the store. (5 words)

He biddnt (didn't = did not) know. (4 words)

The girl went in *t* (the) house. (6 words)

d. Phonetically ambiguous words which can be decoded by reference to specific cues in the text or knowledge of the test situation and materials:

Then I drew on the foam with *mmkr* (magic marker). (8 words)

7. **Nondecodable words.** Nondecodable (i.e., nonsense) words include all letter strings which cannot be interpreted as meaningful words by the definition of decodable words stated above.

As elements in T-units. Nonsense words are counted as elements in T-units when they perform unambiguous and essential grammatical functions in T-units.

a. Nonsense word as subject:

The *mazok* ran away. (4 words)

b. Nonsense word as verb:

The little boy *harlupd* his boat. (6 words)
c. Nonsense word as preposition:

The hunter walked arpet the lake. (6 words)

d. Nonsense word as object of preposition:

The boy shot at nerfy. (5 words)

e. Nonsense word as predicate noun (occurring after "to be" and some linking verbs):

It is a mag. (4 words)

If an article (a, the) does not precede a nonsense word in this position, the grammatical function of the nonsense word is ambiguous, and it should be deleted from the text unless the grammatical function of the word is clear from its usage elsewhere in the text:

It is (mag) (nonsense word deleted)

It is mag/The mag is blue and big. (2 T-units)

f. Nonsense word as direct object. When a nonsense word follows a transitive verb, and there is no decodable word functioning as a direct object of the verb, the nonsense word is assumed to function as a direct object:

He made a bap. (4 words)

He made bap. (3 words)

When a nonsense word follows a verb which can be either transitive or intransitive, the nonsense word should be deleted
from the text unless there is specific evidence that the verb was intended to be transitive. If there is evidence that the verb is transitive in context, and if there is no decodable word functioning as a direct object of the verb, the nonsense word is assumed to function as a direct object. An article and/or adjective preceding the nonsense word or contextual cues can be used to determine whether a verb was intended to be transitive:

She drove (mafæt) (nonsense word deleted)

She drove a mafæt. (4 words)

The farmer grew some rapit. (5 words)

I tasted ramples/I smelled ramples/But I did not like them.

As extraneous material. When nonsense words do not perform unambiguous and essential functions in T-units, they are considered extraneous to the text and are deleted (see II below).

a. Nonsense words which seem to function as adjectives or adverbs are not considered grammatically essential to T-units and are deleted:

A little (toulr) glass fell. (4 words)

The girl worked (nirtl). (3 words)

b. When the grammatical function of a nonsense word is ambiguous, it should be deleted from the text as extraneous material:

The cat (rhot) came back did not see him
Then I put the paper on the foam (och) the paper was yellow.

The big bear ate the little boy and (repel)

When these nonsense words are deleted, the following T-units are derived (see II below):

The cat came back. (4 words)

Then I put the paper on the foam. (8 words)

The paper was yellow. (4 words)

The big bear ate the little boy. (7 words)

Nonsense strings. When a string of nonsense words occurs, only one nonsense word from the string can be incorporated as an element in a T-unit:

The farmer geh (om sok) the cow. ("om sok" should be deleted; "geh" functions as a verb; the T-unit has 5 words)

However, more than one nonsense word may perform grammatical functions in the same T-unit, as long as no more than one nonsense word occurs in a row:

The farmer geh (om sok) the cow and went to the nom.

(10 words)

Nonsense words not used to complete a T-unit become extraneous material (see II below).
8. **Compound words and contractions.** Compound words (i.e., compound nouns, pronouns, prepositions, and adverbs) count as one word. Contractions and hyphenated words count as two words.

   a. **Common compound nouns (1 word):**

      baseball   afternoon   doorbell
      sidewalk   flashlight  doorway
      outdoor    milkman     sunshine
      policeman   hotdog    sunrise
      cardboard   playground breakfast
      bedroom    mailman     sandbox
      bathroom   outside    overhead
      fireman     rootbeer   classroom

      In this year's analysis of reporting stories, "pipe cleaner," "rubber band," and "magic marker" will also be considered single words.

   b. **Compound pronouns (1 word):**

      somebody   anybody   everyone   himself
      nobody     anyone    everything  themselves
      something  anything   someone    myself
      nothing    everybody  noone     herself

   c. **Compound prepositions and adverbs (1 word):**

      throughout  within  upon  underneath
      without     into    alongside anywhere
      onto        inside  anyway  anymore
      outside     anyplace  anyhow
d. Contractions (2 words):

- aren't: are not
- didn't: did not
- won't: will not
- couldn't: could not
- wouldn't: would not
- shouldn't: should not
- can't: cannot

3. Hyphenated words (2 or more words):

- upside-down
- mother-in-law

II. EXTRANEOUS MATERIAL

Extraneous words should be deleted from the text. Five major categories of extraneous material are defined.

1. This category of extraneous words seems to result primarily from inadequate monitoring of what is written. The writer repeats himself verbatim or rewords something already said without deleting the superseded portion of the text. The word or words superseded in the text may be considered a "false start."

   a. In the examples which follow, words in parentheses have been superseded and deleted from the text:

   (and the baby was ded) and the baby was ded. (5 words)

   Then we had to use (some) something else. (7 words)
They and I (a roast) put the roast in the stove. (9 words)

William told Deanette (looked) she looks pretty. (6 words)

(Once upon a time five people) there were two little people and two middle sized and one big one. (13 words)

b. If a complete T-unit is repeated verbatim in the text, but the repetition is separated from the first occurrence by one or more T-units, both occurrences would normally be left in the text:

(1) then the dog left/he walked to the woods and took a nap/later
(2) he woke up/then the dog left/he went home. (5 T-units)

However, when it is apparent that the writer is making a copy of his story, rather than extending it, repeated T-units should be deleted from the text:

(1) (2) (3) (4)
Once upon a time there was a mother goose/she flew in the sky on a bird/she had on a blue dress/(Once upon a time there was a mother goose she flew in the sky on a bird) (3 T-units)

c. If the writer has written two discrete stories, only one should be scored. Distinct stories are generally indicated by spatial separation (different pages or textual separation on same page), separate titles, separate introductions, thematic differences, and/or separate conclusions. The story with more T-units (after eliminating extraneous material) should be scored; the other(s) should be discarded.
2. Omission of grammatically essential elements. This category includes word strings which are rendered grammatically incomplete by the omission of a subject, verb, object, object of preposition, or some other part of speech whose grammatical function is ambiguous. Such incomplete word strings are sometimes called "mazes." As with words in the preceding category, mazes seem to result primarily from inadequate monitoring of what is written; something is accidentally omitted. Unless grammatically incomplete word strings qualify as elliptical constructions (see I, 5 above), they should be deleted from the text. If a dependent clause constitutes a maze, only the dependent clause is deleted.

   a. Subject omitted:

      (the big ____ went first) (no T-unit)

      She went to the forest (so that ____ could fly away)

      (5 words)

   b. Verb omitted:

      (A blue block, a red one, and another one ____ in the bag)

      (no T-unit)

      The father was so big (that when he went to bed his head

      ____ out off the bed) (5 words)

   c. Object omitted:

      (the girl made a ____) (no T-unit)

      A transitive verb must be followed by a noun functioning as

      a direct object. Some verbs may be either transitive or

      intransitive. If (as in the following example) the verb can
reasonably be interpreted as intransitive, no object is required:

I smelled (2 words)

However, if an article follows the verb indicating that it should take a direct object, an object is required:

(I smelled a ____) (no T-unit)

d. Object of preposition omitted:

the cowboy rode (to ____) (3 words)

e. Preposition omitted:

the hunter went (____ the lake) (3 words)

f. When conjunctions are omitted in the text, it is seldom obvious. Generally the clauses which were intended to be linked by a conjunction are able to stand alone as independent T-units (see examples of adjective clauses, noun clauses, adverbial clauses, and coordinated clauses in Section I, 1 above). When they cannot stand alone, other rules for identifying extraneous material apply. However, there is one relatively common situation in which the omission of a conjunction is obvious—when the conjunction "and" is omitted in a list of items:

I used paper foam markers ____ cotton

When three or more things, persons, or events are listed, it is permissible to omit the conjunction normally used to link
the elements in the list to one another. Consequently, the preceding example would constitute a complete T-unit of six words ("I used paper, foam, markers, cotton"). If, however, there are only two elements enumerated, no conjunction should be imputed. For example, "I used paper ___ cotton" would become "I used cotton" ("paper" being considered a false start).

**Exception to the rule.** Occasionally, a single noun may serve grammatical functions in two T-units. This is permissible when a T-unit ends in a noun (object or object of preposition) which also appears to have been intended as the subject of the following T-unit. One of the two T-units in such cases would generally be grammatically incomplete by strict definition. However, since the child has not omitted an essential element but merely failed to repeat it, credit for two T-units should be given:

- I carried the **dog** was hurt
- The train's name was **Toot** said I remember when I was sparkling clean

Two T-units would be formed from each of the preceding statements as follows:

- I carried the dog/dog was hurt/ (2 T-units)
- The train's name was Toot/Toot said I remember when I was sparkling clean/ (2 T-units)
An article preceding the noun (as in "the dog" in the example above) would not be credited in the second T-unit since it is not grammatically essential according to Section I, 4d above.

3. **Redundant subject pronouns.** Redundant subject pronouns should be deleted from the text:

   The ant (*he*) went home (4 words)

4. **Nonsense words not fulfilling a grammatical function.** Nonsense words should be deleted from the text when they do not perform unambiguous and essential grammatical functions in T-units as defined in Section I, 7 (above).

   a. Nonsense words which seem to function as adjectives or adverbs should be deleted:

      the (*brame*) ball rolled (3 words)

      the ball rolled (*milop*) (3 words)

   b. Nonsense words whose grammatical functions are ambiguous should be deleted:

      the cat (*rhot*) came back (did not see him) (4 words)

      (In this example, "rhot" might be a relative pronoun. However, other interpretations are equally plausible, so "rhot" is deleted. Since "did not see him" does not seem to be a restatement of "came back," it becomes a maze and is deleted.)

      then I put the paper on the foam (*och*) the paper was yellow

      (2 T-units: 8 words and 4 words, respectively)
(In this example, "och" might be a conjunction, but since other interpretations are equally plausible, it is deleted from the text. Two T-units result.)

Permissible uses of nonsense words to perform grammatical functions in T-units are discussed at length in Section I, 7 above.

c. When more than two nonsense words occur in a sequence, only one nonsense word from the string can be incorporated as an element in a T-unit:

the farmer geh (om sok) the cow (5 words)

the farmer geh (om sok) the cow and went to the nom (rok) (10 words)

(In the second example, two nonsense words from two separate nonsense strings are used to complete the T-unit.)

5. **Standard introductions and endings.** The child's name, school name, teacher's name, or date should not be considered in T-unit analysis when they occur outside the main body of the text (e.g., at the top or bottom of the page). When "the end" is written outside the main body of the text (at the bottom of the page; not incorporated in a T-unit), it will not be included in the T-unit analysis.
PART II
DEFINITION OF CATEGORIES FOR
SUPPORTING DETAIL ANALYSIS
Reporting and Narrating Tasks

In determining whether a word belongs to one or another category, it should be remembered that a word can be assigned to only one category and that some categories take priority over others.

I. CLASSIFICATION

Words describing the physical attributes, types, functions, or rates of movement of objects or animals are considered classification words if they can reasonably be assigned to one of the following categories. Most such words will be adjectives; some will be nouns, adverbs, and verbs. If a word can be scored in another supporting detail category in addition to classification, the other category takes precedence (this situation is most likely to occur with potential "use or type" words).

1. **Color.** Words describing color.
2. **Shape.** Words describing geometric figures or shape: square, rectangle, rectangular, circle, circular, round, sphere, spherical, cylinder, cylindrical, triangle, triangular, cube, etc.
3. **Texture.** Words describing texture: smooth, rough, bumpy, hard, soft, fuzzy, scratchy, grooved, etc.
4. **Tonality.** Words describing the quality of light or darkness: bright, dim, brilliant, murky, light, dark, foggy, clear, shadowy, sunlit, etc.
5. **Sound level or pitch.** Words describing acoustic volume (intensity) or pitch (frequency): loud(ly), soft(ly), noisy, quiet(ly), thunderous, shrill, low, bass, high, scream, whisper, etc.

6. **Temperature.** Words describing temperature: hot, cold, cool, chilly, warm, tepid, steamy, frosty, freeze, thaw, boil, simmer, etc.

7. **Taste.** Words describing how something tastes (except for purely subjective evaluations like "good," "bad," or "delicious"): sweet, sour, piquant, sharp, bitter, tart, etc.

8. **Material.** Words describing types of materials whether used as adjectives or nouns: wood, leather, plastic, concrete, metal, etc. Several words included in a word list provided to children writing reporting stories should not be scored: paper, cloth, foam, cotton.

9. **Rate of movement.** Words describing rate of movement whether adverbs, adjectives, or verbs: slow(ly), fast, quick(ly), still, creep, walk, run, race, speedy, rush, etc.

10. **Use or type.** Words describing a particular type of object or function. Care must be taken not to include parts of compound words in this category. When in doubt, refer to a dictionary. Proper nouns (names, brand names) are not included here (e.g., John's bike, Ford truck). Words indicating gender or age are included when they modify a noun. Occasionally, nouns will be modified by use or type words functioning as predicate adjectives, predicate nouns, or objects of prepositions (examples in parentheses below).

    Examples:

    fishing rod

    fish pole (or a "pole for fishing")
swimming pool
grocery store
health center
ice skate
dump truck
vacation house
garbage truck
man made
girl rabbit (or "it was a girl")
lady bird
fire truck
train station
office building
doctor's office
flying carpet
magic stick (or "the stick was magic")
haunted house
gas stove
pop bottle
baby alligator
Young man (or "he was young")
grownup person

Several words included in a word list provided to children writing reporting stories should not be counted under use or type: pipe cleaner, rubber band, magic marker.
II. **SUBJECTIVE MODIFIERS**

Adjectives or adverbs which involve subjective evaluations:

- angry
- easy
- hungry
- patriotic
- bad
- friendly
- lazy
- pretty
- beautiful
- funny
- lonely
- sad
- brave
- good
- merry (merrily)
- scary
- busy
- happy (happily)
- nice
- ugly
- courageous
- hard
- odd
- weird
- cowardly

Adjectives describing temperature when referring to persons

III. **CLASS RELATIONSHIPS**

Included in this category are certain words and grammatical constructions commonly used to define class relationships. Although class relationships can be expressed in other ways, class relationships should be tallied only when the specialized words and grammatical constructions defined below occur.

1. Certain **quantifiers** are frequently used to identify some portion (all, part, none) of a class. When quantifiers clearly identify some portion of a bounded class, or **whole**, class relationship should be tallied.

   **Common quantifiers:**
   - any
   - bit
   - each
   - enough
   - most
   - much
   - none (no)
   - one, two, etc. (cardinal numbers)
When a unit of measure is preceded by a cardinal number (e.g., "two cups of the sugar," "one piece of the paper"), the cardinal number receives a number count (see Section VII).

a. Whenever a quantifier + of the + noun occurs, class relationship should be tallied:

None of the blocks were red (6 words)

I used some of the paper (6 words)

Two of the cars were broken (6 words)

b. Whenever a quantifier + of + pronoun occurs, and the pronoun refers to some previously stated whole, class relationship is tallied:

I had five cars/but few of them worked/ (2 T-units)

There was tape/and I used lots of it/ (2 T-units)

c. Whenever a quantifier appears by itself as subject and refers back to a previously stated whole, class relationship should be tallied:

I had paper/some was yellow/ (2 T-units)
d. When a quantifier + noun occurs as the subject of a T-unit, class relationship is tallied:

Several trees were orange (4 words)

Every house was old (4 words)

When a quantifier + noun occurs in the object position, it is not tallied as class relationship but as number concept (see Section VII):

I used some paper (4 words)

2. The occurrence of some words should always be tallied as class relationship:

all
every (everything, everyone, everybody, everywhere)
neither
either
both
other
another
quantifier + more (e.g., one more, few more, etc.)
only (except when used as an adverb)
nowhere, anywhere
nobody

3. Class relationship is scored when subclasses of objects (persons or things, not actions) are explicitly defined by:
a. the affirmation of an attribute for members of one subclass and the negation of that attribute for members of another subclass;

or b. the affirmation of one attribute for the members of one subclass and the affirmation of an opposite or contrasting attribute for members of another subclass.

In both instances, a superordinate class or whole must be clearly stated. A subclass may have only one member.

**Affirmation/negation**

The red blocks have holes/the blue blocks do not (2 T-units)

I had lots of paper/some was yellow/some was not (3 T-units)

(In this example, "paper" is the whole. "Some" receives a class relationship score in both T-units, and the affirmation/negation "yellow/not yellow" also receives a class relationship score.)

I made one boat with sails and one without (9 words)

(Affirmation/negation is sometimes expressed by juxtaposition of the prepositions "with/without").

**Affirmation/affirmation of opposite (or contrasting) attribute**

The red blocks are round/the blue blocks are square/
(2 T-units)

There were four cars/two were long/the others were short/
(3 T-units) (In this example, "cars" is the whole. "Two"
and "others" receive class relationship scores. The affirmation/affirmation of opposite "long/short" also receives a class relationship score.

IV. SPACE

Words which indicate spatial relationships between objects or describe spatially defined attributes of objects, are counted as space words.

1. Common space words:

   above
   across
   alongside
   angle
   apart
   around
   back
   below
   bottom
   butt
   by (when it means "next to")
   center
   corner
   crooked
   curve
   down (when describing position or change in position)
   edge
end (when used spatially)
flat
from (except when it means "with")
front
hole
in (when it means "into" or "inside")
in back of (1 count)
inside
into
left/right
line
middle
next to (1 count)
off (when it means "off of" or "away:"
ons (when it means "onto" or "on top of")
ono onto
out
out of (except when it means "with")
outside
over
rim
side
steep
straight
through
tip
to (when it means "toward" or "onto" or describes a change in location)
to back up (1 count)
together
top
toward
under
up (when describing position or change in position)
up above (1 count)

2. Other space words. Although ordinal numbers (first, second, etc.) are usually counted as time words, sometimes they are used as space words indicating spatial position in a sequence:

He was first in line

Similarly, "next" and "last" are usually considered time words, but sometimes function as space words:

The tree was next to the house

Jan was last in line

V. SERIATION

Included in this category are words which can be used to construct (describe) series of objects or actions. It is not necessary to construct a complete series (i.e., seriate three or more objects or actions along some attribute dimension) in order to receive credit for using seriation words. Examples of seriation words follow.
1. **Words ending in "-est":** largest, strongest, heaviest, tallest, etc.

2. **Words ending in "-er":** smoother, longer, fatter, bigger, etc.

3. **Adjectives preceded by "more" or "most"** and possibly followed by "than," though "than" is not necessary: more kind (than), most kind, more helpful (than), most helpful, more fun (than), most fun, etc.

4. **Adjectives preceded by "less" or "least"** and possibly followed by "than," though "than" is not necessary: less happy (than), least happy, less thick (than), least thick, less afraid (than), least afraid, etc.

5. **Other seriation words:** middle, middle sized (counted as one word), worse, better, in-between, medium, etc.

VI. **CONCEPTS OF PHYSICAL QUANTITIES**

1. **Gross comparison of weight:** heavy, light.

2. **Gross comparison of size or spatial dimension:** little, big, small, tiny, fat, wide, narrow, skinny, thin, long, short, deep, shallow, tall, far, near, close, distant, etc.

VII. **NUMBER CONCEPTS**

1. **Gross comparison of number:**
   
   "more" plus noun (more sticks)
   
   "more" plus noun plus "than" plus noun (more sticks than balls)
   
   "much more" plus noun (much more sticks)
   
   "man more" plus noun (many more sticks)
   
   "lots (and lots)"
all quantifiers when not indicating class relationships
(see Section VII)

2. Equivalencies (stating things are equal or not equal):

The two red ones were the same
It took 13 beans to get the same
A little string equals 2 big ones

3. Fractions:

1/2
1/2
half a cup
a half circle

4. Counting (stating number of items in a set):

a. Cardinal:
It took 9 blocks
There are 3 beads

b. Ordinal:
The first bunny..., the second bunny..., and the last bunny

VIII. TIME

Words describing temporal relationships are included in this
category with the exception of "then," which is never counted as a time
word. Common time words include:
after
again.
always
before
begin
day (as unit of time)
early
end (when referring to time except in "the end" when it stands apart from the text)
everyday
finally
first (and other ordinal numbers when referring to time)
forever
former and latter (in reference to time)
hour
late
long and short (in reference to duration of time)
minute
month
name of day of week
name of month
name of year
never
next and last (when referring to time)
night
now
old and new (when "previous" or "present" can be substituted)

once (except when it occurs in "once upon a time")

one day (counted as one time word when it refers to a point in time rather than a period of time)

over (in reference to time)

second

someday

sometimes

soon

start

time (except in "once upon a time" or when modified by another word)

today

tomorrow

until

week

whenever

while

year

yesterday
PART III
DEFINITION OF ADDITIONAL VARIABLES

Reporting and Narrating Tasks

Two additional variables are scored for both Reporting and
Narrating Tasks: simile/metaphor and explanatory statements.

I. SIMILE AND METAPHOR

Simile and metaphor are forms of analogy which compare dissimilar
objects, persons, or events in order to clarify and describe them. This
comparison is expressed in the word "like" or "as" in simile while it is
only implied in metaphor.

a. Simile

That man was like a mountain
She was not like her sister
I heard a noise like a blow
She fell hard as a rock

b. Metaphor

When my father is mad, he is a dragon

The water laughed

II. EXPLANATORY STATEMENTS

Explanatory statements (1) state causal relationships or (2) pro-
vide purposes or rationales for actions, decisions, or conclusions. The
total number of explanatory statements occurring in each story should be
recorded.
**Causal statements** include all statements which explain: (1) why something happened, happens, will happen, or not; or (2) why something (someone) was, is, or will be (felt, feels, will feel) some way, or not. Although conjunctive adverbs and subordinating conjunctions are frequently used to express causal relationships, they need not be present. Causal statements can occur **within** a single T-unit:

- The boy ate something that made him sick
- The block fell because it was round
- I don't like candy and won't eat it

Causal statements can also occur **across** T-units:

- I fell in the water/now I am rusty
- The little bear was tired/so he went to bed
- And the manager said I want this piece of trash out of here/and the men put him out

**Statements of rationale or purpose** include all statements which explain: (1) the purpose of some feeling, action, or physical attribute; or (2) the basis for reaching a conclusion or holding an opinion. Although conjunctive adverbs and subordinating conjunctions are frequently used to introduce clauses expressing rationales or purposes, they need not be present. Statements of rationale or purpose can occur **within** a single T-unit:

- I used the strong paper so it wouldn't tear
- He thinks he's best because he finished first
Karen went to the house to get some clean clothes

Statements of rationale or purpose can also occur across T-units:

I guess the lion ran away/we never saw him again

The tower fell down/but I don't care/I can build another one

The boat had to be big/they were going to Africa in it

We'll have the picnic today/it's sunny

Certain conjunctions usually indicate an explanatory statement:

because

if...then

therefore

in order to

so that

When these conjunctions do not occur in the text but can be inserted without altering the meaning, explanatory statements are also indicated.
Two additional variables will be scored for Reporting Task stories: transformation-combination verbs and story type.

I. TRANSFORMATION-COMBINATION VERBS

Verbs indicating specific transformations or combinations of materials are included in this category. Verbs which may imply transformations or combinations, but do not specifically describe them, are not included (e.g., to make, to build, to push, to pull, to put, to use, to do, to be, to get, etc.). Examples of transformation-combination verbs follow:

- to attach
- to ball
- to bend
- to color
- to cut
- to draw
- to fasten
- to flatten
- to fold
- to join
- to mark
- to nail
- to pin
- to poke
- to punch
- to scratch
- to screw
- to sever
- to shape
- to stick
- to stretch
- to tape
- to tear
- to tie
- to twist
- to wrap
- to write
II. STORY TYPE

Reporting Task instructions ask for descriptions of "how" a child made whatever he made. Frequently, children do not write about "how" but about "what they made" or simply "what they used." Occasionally, children write about something entirely unrelated to the materials they used. Each Reporting story should be categorized and scored according to the criteria stated below:

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Child's story is irrelevant to task. The story does not describe materials used, what was made, or how it was made. A story which simply labels what was made would be scored in this category.</td>
<td>1</td>
</tr>
<tr>
<td>b. Child enumerates materials used. Child names and possibly describes the materials used. The child does not describe what was made (beyond mere labeling) or how it was made.</td>
<td>2</td>
</tr>
<tr>
<td>c. Child describes what was made (product) but not how it was made. The child's description of what was made includes at least two of the following elements: enumeration of materials, description of spatial relations among materials and/or parts of product functions (what it does, now it can be used), description of physical attributes of the product as a whole.</td>
<td>3</td>
</tr>
</tbody>
</table>
category

d. Child describes *how product was made* (process).

Child describes the transformations and/or combinations of materials necessary to replicate product. Any serious attempt to describe "how" a product was made should be included in this category even though the description may be incomplete. The occurrence of "transformation-combination verbs" is a good indicator that a child is trying to describe the process of making something. Child does not need to name product.
PART V

DEFINITION OF NARRATING TASK VARIABLES

Four additional variables will be scored for Narrating Task stories: organization, dramatic complexity, character identification, and dialogue-conversation.

I. ORGANIZATION

Story organization will be scored low, middle, or high based on the criteria stated below:

1. Low (score = 1)
   
a. Stories without action. Story describes things (objects, situations, people) that are unrelated. The parts of the story (T-units or groups of T-units) do not form a whole.
   
   Once upon a time long long ago I saw a log alive/and it had some eyes and a wooden car and some blocks that was the wooden logs site and a materials and a car/
   
b. Stories with action. The story describes characters and actions that are unrelated. The parts of the story do not form a whole.
   
   Once upon a time there was an old west/it was no men or no ladies or children at the west/at the west it was no horses/I build a pool table/I can shoot pool in a pool alley/
2. **Middle** (score = 2)

   a. **Stories without action.** Story describes one thing or related things such that the parts (T-units or groups of T-units) of the story form a whole. However, there is no closure to the story (i.e., it might go on indefinitely).

   Once upon a time there was a house/it was very big/it had windows and a door/there was flowers in front/

   b. **Stories with action.** Story describes characters and actions that are related. However, there is no closure to the action. Tacked-on endings do not constitute closure (see 3b below).

   Once upon a time there were people in a box house/the little boy and girl are on a clean-up job in the house/the little boy and girl get in a fight at school/the little boy was crying/the mother was in a fight with the father/

3. **High** (score = 3)

   a. **Stories without action.** Story describes one thing or related things such that the parts of the story form a whole. In addition, the story has closure: statement that everything has been said; statement that the whole has been described; summary statement linking parts of story; or an explanatory statement which in some fashion accounts for what was described.
There was a big monster/he had red eyes and green skin/
he was as tall as a building/there was a little monster
too/he looked just like the big monster but smaller/the
big monster was his father/

b. Stories with action. Story describes characters and actions
which are related. In addition, the story has closure: con-
clusion of previously stated action: resolution of conflict,
crisis, or dilemma; statement or prediction of what will
happen after the story ends; or explanatory statement which
in some way accounts for what has happened. Standard endings
("They lived happily ever after," "They had fun," "They went
to bed," "That was the end," etc.) are not acceptable unless
they follow logically from the preceding action.

Once upon a time there was a boy named Mark Park/he was
called Mark Park because he liked to walk in the park just
after dark/one night Mark Park was walking in the park when
he heard a dog bark/he walked a little way/and he saw the
dog that he heard barking/so every night after that Mark
Park and the dog walked together/

II. STORY TYPE

Story type will be scored 1 (not dramatic) or 2 (dramatic) based
on the criteria stated below:

1. Not dramatic (Score 1). A descriptive story in which no
crises, conflicts, or dilemmas are clearly present.
Examples:

a. Once upon a time there was a crook/he knocked out superstar/

b. Once upon a time a pole was talking to a car/the car said
Hey/and I saw a rug talking to a house/and I saw a car
talking to a light/and I saw a car through a stone wall, and
I saw two boxes talking to a house/

c. Once upon a time I saw a man/he was drawing a house/and he
was drawing a school/the man had a little girl and a little
boy/the little girls name is Lytsia/the little boys name is
Jerome/The man was drawing a land/the land was fat/

d. Once upon a time there was a rat/I found him in the old
building/and I named him Todd/and I took him to school one
day/he was nice and pretty/and he was grey and white and
black/I fed him every morning and night certain food/and I
got him a cage with bars/

2. Dramatic (Score 2). A story in which crisis, conflict, or
dilemma is "clearly present." Crises, conflicts, or dilemmas are clearly
present when they (1) explain behaviors, feelings, or situations previously
described, (2) affect subsequent behaviors, feelings, or situations, or
(3) are explicitly resolved.

Examples:

a. Once upon a time I had a car/I took my kids to the park/and
they played on the see-saw and the monkey bars/Then I took
them home/and I went to play some pool/I won three games,
and was happy/I won ten dollars each game/When I was on my way home I got a flat/I fixed the flat and went home and went to bed/

b. Once upon a time there was two little twins/and they were lost/One day they were wandering around in a witches castle/and they saw a carpet/they did not know it was magic/so they were real tired/so they laid down to rest/and they floated up in the air/The next morning they were tied up in a cage/The next thing was that there was a witch there in front of their eyes/and they fainted/

c. Once upon a time a little girl was walking down the street/ a cat dragged her arm/she called for help/Help she called/he bit her arm/she was crying/she ran into a car/the car hit her/she was dead/

d. Once upon a time there was a place called smile land/people in smile land always smiled/one of the smile families left/they went into a bowling alley/they they looked up and saw a large ball coming right for them/then one of them remembered the flying carpets/each of them jumped on it/and away they went/they went back to smile land/and never again did they even speak of leaving/

III. CHARACTER IDENTIFICATION

The clarity of character identity is determined by whether the number of characters is clear and whether actions can be unambiguously
attributed to characters. Character identification is scored according to the following criteria:

1. No identifiable characters.

Examples:

a. The tornado blew the house and the fence and the swing down the road/

b. The biggest dress was on the ground/and once it was on the line/it was blue beads and blocks/

2. Characters present, but identity very confused.

Examples:

a. I heard a crash/I race in my car/I was in trouble/She is a car/my wife have a car/my brother have a car/a boy have a car/this boy have a car/this boy has a house/this car is old/

b. Once upon a time there was a sneaky man and lady/they were sneaking out of jail/and the man and the lady went under the policeman's leg/and they be out looking out for them/see the lady is the grandmother and the man too/and the big one is there/and the girls name is Rhodesia/

3. Some confusion of character identity, not completely clear.

Examples:

a. Once upon a time there was a man/he had a lot of gold/and this lady and boy and girl lived in this old house/they did not have any money or food/so they went to the man who had
the gold/so they got some of the gold/so they were saying
I want it/so they got in their car and left and they were
running after gold/they were running after them in the end/
b. Once upon a time there was a family/they had five children/
their house got burned down/they went to the store and he
wouldn't go/and they moved at supper/they never let him
at the supper table/

4. Identity of all characters clear.

Examples:

a. Once upon a time there was a old man that had a green house/
he was happy until one day a little lady came by/she said
that his next door neighbors were moving to town/then the
next day his dog brownie ran away/he was very very sad/then
he had new neighbors next door to him/Their last name was
Mr. and Mrs. Dairs/

b. Once upon a time there was a family/and pops name was Bob/
and moms name was Shirley/and my sisters names are Sherry and
Teresa/and my name is Violet/and we was going to our friends
house/and on the way we had a wreck/no one was hurt at all/
and I made my big sleep on the floor/and we ate a cow each/
and it did not taste good/and we did not eat until a year
past/then we never ate a cow each again/
IV. DIALOGUE-CONVERSATION

If anywhere in the story a character speaks or thinks out loud, the story receives a score of 2 on this variable. If nothing is said by a character in the story, the story receives a score of 1. Quotes attributable to the narrator are not counted as dialogue-conversation unless the narrator is assuming a role in the story. In addition, when a child recounts something that someone has said, rather than having the character say it, it should not be counted as dialogue-conversation (e.g., he said that he did not care).

1. Score 1: no dialogue-conversation

   And the boy fell in the lake/wait/I think he was pushed/the boy was pushed/ (narrator talking)

   She said that his next door neighbors were coming tomorrow (recounting what someone said)

2. Score 2: dialogue-conversation

   Toot said I remember when I was sparkling clean (character speaking)

   But I said no/I won't go/ (narrator speaking in character)

   Once upon a time there was a car/and there was a fire in the forest/and the car saw the fire/So what if I was a truck I would get all the people out of the forest/and the people would be okay.../ (thinking out loud)
1. **Nonsense word as verb** (replaces Part I, Sec. II, 7b, p. 6).

   A nonsense word in the verb position is assumed to be transitive and, thus, to require a direct object unless there is clear indication that the nonsense word was intended to function as an intransitive verb:

   The little boy *barluped* his boat (6 word T-unit; direct object present)

   Mary *warpa* into the house (5 word T-unit; no direct object but prepositional phrase indicates that the nonsense word functions as an intransitive verb)

When there is neither a direct object nor any indication that the nonsense word functions as an intransitive verb, the nonsense word should be deleted from the text and the remainder of the statement scored according to the criteria stated in Part I, Section II, "Extraneous Material":

   The little boy *(barluped)* (no T-unit)

   Man *(ramnit erbel)* (no T-unit)
APPENDIX F

LANGUAGE ANALYSIS VARIABLES
# LANGUAGE ANALYSIS VARIABLES

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>Type-token Ratio</td>
<td>Number of different words (types) divided by the total number of words (tokens); yields a measure of vocabulary size.</td>
</tr>
<tr>
<td>Diversity</td>
<td>Words not on Dolch Vocabulary List</td>
<td>Frequency of words used by children that are not on the Dolch Vocabulary List; another method of measuring vocabulary size.</td>
</tr>
<tr>
<td></td>
<td>Classification Words</td>
<td>Frequency of words which name the color, material, shape, or texture of something.</td>
</tr>
<tr>
<td></td>
<td>Spatial Words</td>
<td>Frequency of words which indicate the spatial relationship of one object to another, e.g., into, on top of, etc.</td>
</tr>
<tr>
<td></td>
<td>Seriation</td>
<td>Frequency of words indicating some ordering, e.g., smoother, tallest, most beautiful, etc.</td>
</tr>
<tr>
<td></td>
<td>Time words</td>
<td>Frequency of temporal words; excluded the use of &quot;then.&quot;</td>
</tr>
<tr>
<td>Category</td>
<td>Variable</td>
<td>Explanation</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Linguistic</td>
<td>Number Words</td>
<td>Frequency of cardinal numbers, including the use of fractions.</td>
</tr>
<tr>
<td>Diversity (continued)</td>
<td>Physical Quantity</td>
<td>Frequency of gross comparisons of weight (e.g., heavy) or size or spatial dimension (big, far, skinny, deep).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Modifiers: Subjective</strong> Frequency of any modifying words that indicate an evaluation or personal opinion, e.g. very, pretty, silly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Modifiers: Factual</strong> Frequency of any modifying words that indicate a description of an object or person not included in the classification category.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Modifiers: Clauses</strong> Frequency of adjective or adverbial clauses, e.g., &quot;The man who was behind the tree hit the other man.&quot;</td>
</tr>
<tr>
<td>Syntactic</td>
<td>Number of Complete T-units</td>
<td>Frequency of complete T-units, or the simplest part of a sentence that can stand alone, together with any subordinate clauses that may be grammatically related; considering the unique demands of conver-</td>
</tr>
<tr>
<td>Category</td>
<td>Variable</td>
<td>Explanation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Syntactic Performance</td>
<td>Number of Complete T-Units</td>
<td>a T-unit can be grammatically incomplete, a simple sentence, or a complex sentence.</td>
</tr>
<tr>
<td>(continued)</td>
<td>(continued)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average length of T-Units</td>
<td>The total number of words divided by the total number of T-units.</td>
</tr>
<tr>
<td></td>
<td>Percentage of complex T-units</td>
<td>The number of complex T-units divided by the number of complete T-units.</td>
</tr>
<tr>
<td></td>
<td>T-units</td>
<td></td>
</tr>
<tr>
<td>Qualitative Style</td>
<td>Simile and Metaphor</td>
<td>Frequency of use of analogy, expressed in the word &quot;like&quot; or &quot;as&quot; for simile and implied for metaphor, e.g., &quot;He flew back like an airplane.&quot; &quot;The water laughed.&quot;</td>
</tr>
<tr>
<td>Variables</td>
<td>Explanatory Statements</td>
<td>Total number of times statements occur which give causal relationships or provide purposes or rationales for actions, decisions, or conclusions.</td>
</tr>
<tr>
<td></td>
<td>Story Organization</td>
<td>Rating of story on three-point scale according to relatedness of characters and parts of story (e.g., beginning, middle, closure). Narrating Task and Oral Task.)</td>
</tr>
<tr>
<td>Category</td>
<td>Variable</td>
<td>Explanation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Qualitative</td>
<td>Transformation-Combination Verbs</td>
<td>Frequency of occurrence of verbs describing the combination or changing of materials used in the play phase of the session (e.g., attach, pin, cut, flatten, join, etc. (Reporting Task Only).</td>
</tr>
<tr>
<td>Style Variables</td>
<td>Story Type</td>
<td>Reporting Task: Rating of four point scale of child's ability to describe &quot;how&quot; he made what he made, i.e., whether story is irrelevant to task, simply lists materials used, describes the end product, or describes process by which article was made. Narrating Task: Rating of story as dramatic (i.e., containing crises, conflicts, or dilemmas) or not dramatic (i.e., without crisis, etc.)</td>
</tr>
<tr>
<td>(continued)</td>
<td>Dialogue</td>
<td>Narrating Task: Rating of whether or not any character or characters speak or think out loud at any point in the story. Oral Task: Number of times words are assigned to the cartoon characters.</td>
</tr>
<tr>
<td>Category</td>
<td>Variable</td>
<td>Explanation</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Qualitative</td>
<td>Character ID</td>
<td><strong>Narrating Task:</strong> Rating of character identification on four-point scale, from no identifiable characters to all characters clearly identified.</td>
</tr>
<tr>
<td>Style Variables</td>
<td></td>
<td><strong>Oral Task:</strong> Rating of whether characters are or are not identified in some personal way (e.g., by name, occupation, personal relationship).</td>
</tr>
<tr>
<td>(continued)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra Objects</td>
<td></td>
<td>Rating of whether or not objects or places not shown in the cards are mentioned. (Oral Task only.)</td>
</tr>
<tr>
<td>Extra Actions</td>
<td></td>
<td>Rating of whether or not actions or feelings not shown in the cards are described. (Oral Task only.)</td>
</tr>
</tbody>
</table>
Table A
Means and Standard Deviations of Linguistic Complexity and Diversity Measures in the Oral and Written Language of FT and NFT Subjects

<table>
<thead>
<tr>
<th>Language Variables</th>
<th>Follow Through</th>
<th>Non Follow Through</th>
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<tbody>
<tr>
<td></td>
<td>n</td>
<td>X</td>
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<tr>
<td>Written 1</td>
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<tr>
<td>T-Unit</td>
<td>34</td>
<td>6.44</td>
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<tr>
<td>% Complex T-Units</td>
<td>34</td>
<td>.08</td>
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<tr>
<td>Type-Token Ratio</td>
<td>34</td>
<td>2.81</td>
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<tr>
<td>Written 2</td>
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<td></td>
</tr>
<tr>
<td>T-Unit</td>
<td>34</td>
<td>12.26</td>
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<tr>
<td>% Complex T-Unit</td>
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<td>Type-Token Ratio</td>
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<td>3.72</td>
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<tr>
<td>Combined Written (W1 + W2)</td>
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<td></td>
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<tr>
<td>T-Units</td>
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<td>9.55</td>
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<tr>
<td>% Complex T-Units</td>
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<td>.14</td>
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<tr>
<td>Type-Token Ratio</td>
<td>34</td>
<td>3.26</td>
</tr>
<tr>
<td>Oral</td>
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<td></td>
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<tr>
<td>T-Units</td>
<td>34</td>
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<tr>
<td>% Complex T-Units</td>
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<td>Type-Token Ratio</td>
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<td>3.65</td>
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Table B

Means and Standard Deviations of Linguistic Complexity and Diversity Measures in the Oral and Written Language for the Combined Groups of Subjects

<table>
<thead>
<tr>
<th>Language Variables</th>
<th>Combined Scores of FT and NFT Subjects</th>
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<tr>
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<tr>
<td>Written 1</td>
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<tr>
<td>T-Units</td>
<td>70</td>
</tr>
<tr>
<td>% Complex T-Units</td>
<td>70</td>
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<tr>
<td>Type-Token Ratio</td>
<td>70</td>
</tr>
<tr>
<td>Written 2</td>
<td></td>
</tr>
<tr>
<td>T-Units</td>
<td>70</td>
</tr>
<tr>
<td>% Complex T-Units</td>
<td>70</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>70</td>
</tr>
<tr>
<td>Combined Written (W1 + W2)</td>
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</tr>
<tr>
<td>T-Units</td>
<td>70</td>
</tr>
<tr>
<td>% Complex T-Units</td>
<td>70</td>
</tr>
<tr>
<td>Type-Token Ratio</td>
<td>70</td>
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<tr>
<td>Oral</td>
<td></td>
</tr>
<tr>
<td>T-Units</td>
<td>70</td>
</tr>
<tr>
<td>% Complex T-Units</td>
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<tr>
<td>Type-Token Ratio</td>
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Table C

Analysis of Variance Summary of Linguistic Complexity and Diversity Measures for FT and NFT Groups on One Oral and the Combined Scores of the Two Written Language Trials

<table>
<thead>
<tr>
<th>Linguistic Measures</th>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
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<tbody>
<tr>
<td>Number of T-Units</td>
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<tr>
<td>Groups</td>
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<td>76.68</td>
<td>.27</td>
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<tr>
<td>Error (G)</td>
<td>68</td>
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<td>281.18</td>
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<tr>
<td>Between Totals</td>
<td>69</td>
<td></td>
<td>278.22</td>
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<tr>
<td>Percentage of Complex T-Units</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
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<td>.001</td>
<td>.02</td>
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<td>Error (G)</td>
<td>68</td>
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<td>.03</td>
<td></td>
</tr>
<tr>
<td>Between Totals</td>
<td>69</td>
<td></td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Type-Token Ratios</td>
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<td></td>
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<tr>
<td>Groups</td>
<td>1</td>
<td></td>
<td>1.10</td>
<td>3.01</td>
</tr>
<tr>
<td>Error (G)</td>
<td>68</td>
<td></td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>Between Totals</td>
<td>69</td>
<td></td>
<td>.38</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
*** p < .001
Table D

Analysis of Variance Summary of Linguistic Complexity and Diversity Measures for Oral and Written Language Trials of FT and NFT Groups

<table>
<thead>
<tr>
<th>Linguistic Measures</th>
<th>Source of Variance</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trials</td>
<td>1</td>
<td>166807.54</td>
<td>694.81***</td>
</tr>
<tr>
<td></td>
<td>G x T</td>
<td>1</td>
<td>174.93</td>
<td>.729</td>
</tr>
<tr>
<td></td>
<td>Error (T)</td>
<td>68</td>
<td>240.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within Total</td>
<td>70</td>
<td>2618.68</td>
<td></td>
</tr>
</tbody>
</table>

Percentage of Complex T-Units

|                     | Trials             | 1                  | .0007       | .03     |
|                     | G x T              | 1                  | .003        | .11     |
|                     | Error (T)          | 68                 | .03         |         |
|                     | Within Total       | 70                 | .02         |         |

Type-Token Ratio

|                     | Trials             | 1                  | 6.07        | 21.45*** |
|                     | G x T              | 1                  | .03         | .11     |
|                     | Error (T)          | 68                 | .28         |         |
|                     | Within Total       | 70                 | .36         |         |

* $p < .05$
** $p < .01$
*** $p < .001$
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