THE UNIVERSITY OF MANITOBA

THE RELATIONSHIP BETWEEN SOCIOMETRIC STATUS AND SELECTED MEASURES OF ORAL LANGUAGE PERFORMANCE IN FIRST AND SECOND GRADE CHILDREN

BY

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A THESIS

PRESENTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF EDUCATION

THE FACULTY OF EDUCATION

WINNIPEG, MANITOBA

MAY, 1978

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A dissertation submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

To

my mother and father,

Beth and Mel Pipe,

who developed in me

the love of learning,

the motivation to achieve,

the diligence,

the persistence,

and the self-confidence

necessary to accomplish this task.

Acknowledgments

The writer gratefully acknowledges indebtedness to Dr. Doris Baker for her enthusiastic interest in the study, her guidance at every stage of the project, her skillful editing of the manuscript, and her unfailing confidence in the writer.

Appreciation is also expressed to Prof. Henry Schulz for his advice regarding the pilot study, the design of the research, and the statistical analysis of results, as well as for his careful consideration of the manuscript.

Gratitude is extended to Dr. Bernard Klassen for his assistance in the selection and use of the language measures and for his helpful review of the manuscript.

The writer wishes to express thankfulness to Donna Lean, Dianne Osland, and Donna Wenham for their expertise, reliability, and great diligence in the interviewing of subjects and the transcribing of language samples.

Appreciation is extended to Mr. Mark Bishop for writing and running the computer program which so greatly facilitated the analysis of the language samples.

The writer wishes to thank her principal,

Mr. W. G. Chomichuk, for allowing the use of equipment and facilities and for assisting in obtaining parental permission for the children involved in the study.

The writer is grateful to her team partners, Mrs. Lorraine Baydack, Mrs. Yvonne Loiselle, Mrs. Jennifer Nock, and Miss Adeline Sokulski for their willing co-operation while the study was being conducted and their encouragement and optimism throughout the entire project.

Finally, the writer thankfully acknowledges indebtedness to her husband, Harry, for the many evenings and week-ends he spent entertaining their daughter, Celesta, and for his advice, assistance, and loving support.

Abstract

The purpose of the study was to determine whether or not a relationship exists between popularity, as measured by sociometric status, and the volubility, vocabulary, and syntactic complexity of oral language.

Thirty-six subjects were randomly selected from a total group of 116 first and second grade students who were attending a K-8 school in a newly developed suburb of Winnipeg, Manitoba.

The subjects' sociometric status scores were calculated from the results of the Sociometric Test, administered to the total group of 116 students.

Language samples were obtained by trained interviewers through the use of prescribed statements in conjunction with a soundless film and a series of pictures from a basal reading program. The language samples were tape recorded, transcribed verbatim, and analyzed for two measures of volubility (total words and total T-units), one of vocabulary (corrected type-token ratio), and four of syntactic complexity (mean T-unit length, proportion of "short" T-units, number of nouns modified by prepositional phrases per 100 T-units, and number of noun clauses per 100 T-units).

The language measures were found to correlate

highly with each other. None of them, however, was found to be significantly related to sociometric status.

The study concluded, therefore, that, within the context of its delimitations, no relationship exists between popularity and oral language performance.

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Chapter 1

Introduction

A Common Assumption

There exists a commonly held assumption that people who are good speakers acquire a wide circle of friends and possess the potential to become leaders of men. References to this assumed relationship between oral language performance and social relations are found in both ancient and modern writing.

The Latin orator, Cicero (in Kline, 1924) declared, "Nothing seems to me more noble than to be able to fix the attention of assemblies of men by speaking, to fascinate their minds, to direct their passions to whatever object the orator pleases, and to dissuade them from whatever he desires" (p. 6).

Yardley (1971) reiterated this belief. "In our society the articulate person leads. He influences the minds of others" (p. 9).

Crosby (1964) wrote, "We know that basic relations with other human beings are in large measure related to experience with spoken language. Like personal development, social growth is inextricably interwoven with language power" (p. 5).

Strickland stated that "human relationships are highly dependent upon language" (1953, pp. 28, 29) and that "The nature of human relationships is closely related to the quality of communication" (1971, p. 40).

The Dale Carnegie Course in Effective Speaking and Human Relations has been taught for 65 years. Two million people, from 50 countries, have been graduated. Carnegie designed and promoted the course because he believed that the ability to speak well makes a man socially visible and greatly enhances his chance to become a leader. The tremendous, sustained response to his course attests to the fact that thousands agree with him. "The ability to speak is a short cut to distinction. It puts a man in the limelight, raises him head and shoulders above the crowd" (Carnegie, 1937, p. 7). "Leadership gravitates to the man who can talk" (Carnegie, 1937, p. 5).

Supporting Research

It is apparent, then, that a relationship between oral language performance and social relations is widely assumed to exist.

Oral Language and Leadership

Most of the research concerned with establishing

this relationship has focused on the leadership aspect of social relations.

A number of studies have investigated the relationship between leadership and volubility (amount of language produced). Stogdill (1948) noted that the findings of the studies he reviewed tended to support the existence of a leadership/talkativeness relationship.

Goodenough (1930) observed 33 nursery children who ranged in age from 27 to 59 months. She found that talkativeness, "amount of verbal activity without regard to its nature or quality" (p. 37), was correlated (+.61) with observed leadership behavior. (Leadership behavior in this study was measured by the frequency with which children engaged in eight categories of behaviors: being interfered with by another child, interfering with another child, rebelling against the interference of a peer, observing a group of children, participating with a group of children, being opposed in attempting to coerce another child, dominating a group by force or trickery, and being imitated or persuading others to follow.)

Ahlbrand and Hudgins (1970) conducted a study which involved fourth to ninth grade students. They found that children who participated most in question-answer periods were most often rated as the "best" leaders by their peers.

Zeleny (1939) found a moderately high relationship

(r = .65-.85) between peer-rated leadership and observed participation in college level discussion groups.

O'Connor (1972) also reported, in a study involving college students, that a positive relationship existed between leadership and participation (measured by observing the amount of mouth movement through one-way glass).

This relationship between peer-rated leadership and amount of participation during group discussions was supported, in part only, by Wilson's (1971) study of 100 male college students. He found that a positive association existed between leadership and participation when an observer was present but not when a secret observer watched through a one-way mirror.

Slater (1955) reported that 55 percent of the male college students who were identified by their peers as leaders during group discussions were also observed to be the most talkative. This relationship between leadership and amount of talking was, however, less strong than that between leadership and ability to guide the discussion, amount of interaction received, and quality of ideas.

Another aspect of oral language performance in relation to leadership was studied by Flaherty (1967). College females who were most highly chosen by peers as potential leaders had significantly higher verbal ability on the College Entrance Examination Board Scholastic Aptitude Test than did females most often identified as

not being potential leaders.

Leadership and Popularity

Encompassed within the assumption that a relationship exists between oral language performance and social relations is the belief that speaking ability is related to popularity as well as to leadership potential. "The primary motive of language is to influence the activity of others. Its secondary use is to enter into more intimate social relations with them" (McCarthy, 1930, p. 37).

The exact extent to which popularity and leadership are related has not, as yet, been determined. That the two terms are not synonymous, however, has received considerable support.

In a fairly comprehensive examination of the leadership/popularity question, Gibb (1969) cited studies by Bales, Gibb, and Hollander and Webb, all of whom reported that the people chosen as best-liked among their peers were not identified as the leaders. In a study involving 100 male undergraduates, Slater (1955) found that the "best liked man is in fact chosen leader no more often than would be expected by chance" (p. 304). While not all research findings have indicated such disparity between leadership and popularity (e.g., Zeleny, 1939), it would nevertheless seem that the two are distinct.

Oral Language and Popularity

Relatively few studies have attempted to establish a relationship between oral language performance and popularity.

Most of the research which has been done in this area has centered around the relationship between popularity and the physical production of speech. Woods and Carrow (1959), in a study involving children in grades two and five, found that speech-defective children were less accepted as friends and playmates than were children with normal speech. In addition, they found that, among children with speech defects, those who had articulatory difficulties were less accepted than were those who stuttered.

Marge (1969) also found that children with speech handicaps were somewhat less popular than were normal-speaking children.

Woods (1974), on the other hand, found that, among third to sixth grade boys, those who stuttered were not rated differently on social position criteria than were their normally-fluent peers. Having noted that the results obtained by seven other studies in this field conflicted with each other, Woods concluded that the findings regarding the relationship between speech production and popularity were inconclusive.

In investigating the relationship between popularity

and oral language performance, a few studies have been concerned with volubility. Slater (1955) found that, among male college students, the men who were observed to talk the most during group discussions were seldom rated by their peers as best-liked (r = .24).

Bonney and Powell (1953) found that first graders who were highly chosen as preferred work and play-mates were not observed to talk more to children or to adults, but they did make more voluntary contributions to groups (e.g., gave suggestions, told stories).

In a study involving fourth to ninth grade students, Ahlbrand and Hudgins (1970) found that pupils who answered more questions during class received more choices as popular students than did their low-participating peers.

Oral language performance obviously involves more than adequate speech production and amount of verbalization. Burks (1938) and Mally (1936) described college students who were rated as social successes by their peers as having "vividness and originality of description" (Burks, 1938, p. 132) and "ease in light conversation" (Mally, 1936, p. 223). With the exception of these two studies, research into the relationship between popularity and aspects of oral language other than speech production and volubility is essentially non-existent.

Needed Research

While a number of studies have investigated the relationship between oral language performance and social relations, it is apparent that there are areas which have not, as yet, been explored.

Leadership has been related to amount of verbalization. Is it also related to physical production of speech (i.e., articulation and fluency), to diversity and range of vocabulary, and to syntactic complexity?

Several studies have explored the relationship between popularity and speech production, with inconclusive results. A few investigations have examined the relationship between popularity and amount of verbalization, again without definitive results. Further studies in these two areas are clearly needed. Moreover, the relationship between popularity and other aspects of oral language has yet to be investigated. Is popularity related to diversity and range of vocabulary? Is popularity related to level of syntax?

Out of this need for further research into the relationship between oral language performance and social relations came the purpose of the present study.

Purpose, Design, and Scope of the Study

The purpose of the study was to determine whether or

not a relationship exists between popularity (defined in terms of peer choices on the Sociometric Test) and several aspects of oral language (i.e., volubility, vocabulary, and syntax).

Thirty-six subjects were randomly selected from a total group of 116 first and second grade students. Three certified and experienced female teachers were trained as interviewers. They administered the Sociometric Test to each of the 116 students individually. From the results of this test, a measure of popularity, sociometric status, was calculated for each of the 36 subjects. Oral language samples were obtained in one adult-one child interviews. A soundless film and a series of pictures were used as eliciting stimuli. The language samples were analyzed for two measures of volubility, one of vocabulary, and four of syntactic complexity.

The scope of the study was limited by (a) the measure of popularity used, (b) the aspects of oral language considered, (c) the particular measures of volubility, vocabulary, and syntax employed, (d) the procedures and stimuli used to obtain the language sample, (e) the age range of the subjects, and (f) the characteristics of the population from which the subjects were drawn.

Questions to be Answered

The present study sought to answer the following

questions:

1. Is there a relationship between sociometric status and the volubility of oral language as measured by: (a) the total number of words per language sample, and (b) the total number of T-units per language sample?

2. Is there a relationship between sociometric status and the vocabulary of oral language as measured by the type-token ratio (corrected)?

3. Is there a relationship between sociometric status and the syntactic complexity of oral language as measured by: (a) mean number of words per T-unit, (b) proportion of "short" T-units, (c) number of nouns modified by prepositional phrases per 100 T-units, and (d) number of noun clauses per 100 T-units?

4. Is the relationship between sociometric status and one of the measures of volubility significantly greater than the relationship between sociometric status and the other measures of volubility?

5. Is the relationship between sociometric status and any one of the syntactic measures significantly greater than the relationship between sociometric status and the other measures of syntax?

6. Is the relationship between sociometric status and either of the volubility measures significantly different from the relationship between sociometric status and the vocabulary measure?

7. Is the relationship between sociometric status and either of the volubility measures significantly different from the relationship between sociometric status and any of the syntactic measures?

8. Is the relationship between sociometric status and the vocabulary measure significantly different from the relationship between sociometric status and any of the syntactic measures?

Value of the Study

In attempting to determine whether or not a relationship exists between popularity and the volubility, vocabulary, and syntactic complexity of oral language, the study extended the present body of knowledge.

In addition, the study provided a necessary prerequisite for future investigations. If a relationship between popularity and oral language performance were shown to exist, an attempt could be made to determine whether or not improving a student's oral language skills would improve his present and/or future popularity status. Findings from studies of this nature would have important implications for curriculum planning.

Definition of Terms

A number of terms used in the study require

definition.

Sociometric status. The sociometric status of an individual is determined by counting the total number of choices received from classmates on the Sociometric Test, an instrument originated by Moreno in 1932 and developed by Bronfenbrenner (1945), Northway (1957), and Gronlund (1959). The particular version of the Sociometric Test used in this study was based on the models suggested by Northway (1957) and Gronlund (1959).

Volubility. Volubility is the amount of language produced. It is measured in this study by total number of words and total number of T-units per oral language sample.

Type-token ratio. The type-token ratio, corrected for unequal sample sizes, is calculated by dividing the number of different words (types) by the square root of twice the total number of words (tokens) used in the language sample (Carroll, 1964). The type-token ratio is a measure of the diversity of vocabulary.

T-unit. T-unit, an abbreviation for minimal terminable syntactic unit, consists of "one main clause with all the subordinate clauses attached to it" (Hunt, 1965,

p. 20). (Simple and complex sentences thereby qualify as T-units.) Mean number of words per T-unit is a measure of syntactic complexity.

"Short" T-unit. A "short" T-unit is a T-unit of less than nine words (Hunt, 1965). Proportion of "short" T-units to total T-units is a negative index of syntactic complexity.

Chapter 2

Review of Related Literature

In light of this study's purpose, the review of the recent literature focused on five major areas. Four of the areas are related to oral language performance. These include language sampling techniques, volubility of language, vocabulary measures, and measures of syntactic complexity. The fifth area, sociometric testing, is related to popularity.

Language Sampling Techniques

Methods used to obtain oral language samples differ widely with respect to both procedures and stimuli.

Procedures Used to Obtain Language Samples

Oral language samples have been obtained by having children engage in free-play, talk to audiences of peers, answer interviewers' questions, and verbalize freely with adult encouragement. Combinations of procedures have also been used. That the type of procedure employed can affect the volubility and syntactic complexity of oral language has been demonstrated by Hahn (1948) and Shields and Steiner (1973).

Free play. Oral language samples are sometimes obtained while children play freely. Johnson (1974) recorded the verbalization of preschoolers as they played together in a nursery classroom and on the schoolground. In Davis and Seitz's (1975) study, language samples were collected as children played with their mothers.

Show and tell. Several investigators have obtained samples of oral language as children talked to audiences of peers. Martin (1955) recorded the speech of first grade students as they described, for their classmates, objects of personal interest. Melear (1974) had children talk about their own drawings to their classmates.

Response to questioning. Having children respond to questions asked by adults is another way to obtain samples of oral language. In a study by Williams, Weinstein, and Blackwood (1970), for example, students were asked, after being shown a picture, three questions designed to initiate responses at the literal, interpretative, and critical levels of thought.

The findings of a study by Shields and Steiner (1973), however, suggest that in some cases, at least, the question/answer procedure can restrict the production of language.

Free verbalization. By far the most common procedure for obtaining oral language samples involves having children verbalize freely in response to a stimulus. Children are interviewed individually. Stimuli familiar and interesting to the children are used. The interviewer establishes rapport with the subjects, presents the stimulus, and invites verbalization by such statements as "Tell a story about the picture (film)", "Describe what you see", "Tell what is happening", and "Tell what you think will happen next". The interviewer "avoids excessive participation, at the same time encouraging as much spontaneous speech as possible" (Engler, Hannah, & Longhurst, 1973). Despite the fact that the language obtained by this procedure is elicited by stimuli and statements, and encouraged by the interviewer, it is described as "free" and "spontaneous" because the eliciting statements are open-ended, the interviewer avoids offering his opinion or commenting at length, and the child's attention is not redirected when the content of his talk ceases to be related to the stimulus being presented.

This free verbalization procedure has been widely used in the study of children's language development (Bougere, 1968; Braun, 1969; Ciani, 1976; Fox, 1972; Harrell, 1957; Hass & Wepman, 1974; Loban, 1963; McCarthy, 1930; O'Donnell, Griffin, & Norris, 1967; Shriner, 1967;

Shriner & Sherman, 1967; Templin, 1957). Investigations into the relationship between oral language and reading achievement have also involved the use of free verbalization (Fry & Johnson, 1973; Shepherd, 1974). Finally, the free verbalization procedure has been employed, by Prutting, Gallagher, and Mulac (1975), in the assessment of a published test (the Northwestern Syntax Screening Test).

Combinations of procedures. Investigators often use several procedures in combination to obtain their language samples. Hahn (1948) recorded the oral language of first grade students during show and tell periods and during adult-child interviews. Loban (1963) had students answer questions (about such subjects as playmates, games, television, parties) and talk about a series of pictures. In Menyuk's (1963, 1964) study, language samples were obtained by the use of a projective test, adult questioning, and role-playing with peers. Chomsky (1972) had children answer questions, "play games, carry out tasks, manipulate toys, identify pictures, and engage in conversation" (p. 5). Shields and Steiner (1973) recorded speech during spontaneous play, adult questioning, and "mutual discourse" (p. 100) between adult and child.

Stimuli Used to Elicit Oral Language

A variety of stimuli have been used to elicit oral language. That the type of stimulus can affect the language sample obtained has been suggested by several studies.

Cazden (1970) reviewed six such studies, all of which reported differences in oral language in relation to the use of different stimuli.

Bougere (1968) calculated reliability coefficients (obtained by two-way analysis of variance) for eighteen language variables across three samples of oral language. In eliciting the three samples, she used two different stimuli. She reported "moderate to low coefficients of reliability from one language sampling situation to the other" (p. 96) and concluded, on that basis, that the accuracy of a language sample would be increased by the use of more than one stimulus.

The types of stimuli most frequently used to elicit oral language include pictures, objects, and films. In addition, combinations of stimuli are often used.

Pictures. One common type of stimulus is a series of pictures. Cazden's (1970) review of investigations into the facilitating effect of a number of stimuli on oral language production suggested that the use of pictures was appropriate.

Many different kinds of pictures have been used and series of pictures have ranged widely in size. Melear (1974) used the subjects' own drawings. Shepherd (1974) used three color prints. Williams, Weinstein, and Blackwood (1970) used three pictures from the Chandler Language Art Series. Prutting, Gallagher, and Mulac (1975) used six pictures from the Peabody Language Development Kit. Loban (1963) also used a series of six pictures. Fry (1968) used 18 pictures in his first study and 20 in his next (Fry & Johnson, 1973). Hass and Wepman (1974) used the twenty picture cards in the Thematic Apperception Test.

Objects. Objects are another type of stimulus for eliciting oral language. Screwdrivers and water sprinklers were chosen by Jackson and McFetridge (1972). Sharf (1972) used a variety of toys and objects.

Films. A number of investigators have used films to elicit oral language. Harrell (1957) showed students a black and white sound movie about bear cubs. O'Donnell, Griffin, and Norris (1967), Fox (1972), and Ciani (1976) all projected two Aesop fable movies with the sound track shut off.

Combinations of stimuli. Two or more types of stimuli are often used together to elicit a language

sample. Picture books and toys (car, cat, telephone, mouse, music box, and ball) were used by McCarthy (1930), Templin (1957), Shriner (1967), and Shriner and Sherman (1967). Bougere (1968) chose a sequence of pictures which illustrated a story and two fable films without sound track. Braun (1969) used a fable filmstrip and a soundless story film.

Volubility of Language

Two measures of volubility (amount of language produced) are the total number of words in a language sample and the total number of T-units used.

Total Number of Words

Many investigations have calculated the total number of words per language sample. Within each of these studies, a certain set of stimuli and a particular language sampling procedure were used with children of different ages. Across the investigations, however, the stimuli and procedures varied. There is, nevertheless, a high degree of consensus among the findings: total number of words increases with age.

McCarthy (1930) found that the total number of words used per sample increased markedly between the ages of 18 and 54 months.

Fox (1972) reported an increase in the total number of words uttered from kindergarten to Grade 3.

Ciani (1976) reported an increase in total words between the first and third grade.

Loban (1963) found that the mean number of words in oral language samples increased from kindergarten to Grade 6.

In a study of the oral language of children at kindergarten, and first, second, third, fifth, and seventh grade levels, O'Donnell, Griffin, and Norris (1967) determined that total number of words increased steadily with grade level.

Harrell (1957) reported that total words used increased, with fluctuations, between the ages of $9\frac{1}{2}$ and $15\frac{1}{2}$.

Besides increasing with age, total number of words per sample has been shown to be positively related to ability level (McCarthy, 1930) and to rankings by speech judges on vocabulary and syntax scales of quality (Wilson, 1969).

Using total words as a measure of language development has been criticized, however. McCarthy (1930) noted that the variability from child to child on this measure is large. O'Donnell, Griffin, and Norris (1967) believe that, despite the "high positive correlation" (p. 42) between grade level and total wordage, gross word-count

is an inadequate measure of language maturity. They cite, in support of this belief, the findings of their study which showed that, while the total number of words increased least between kindergarten and Grade 1, and between Grade 5 and Grade 7, mean length of T-unit and mean number of sentence-combining transformations per T-unit showed the greatest increments at precisely these points.

Fox (1972), on the other hand, reported findings which conflicted with those of O'Donnell, Griffin, and Norris. In her study, which was designed to replicate O'Donnell, Griffin, and Norris's (1967), Fox found that significant growths in number of words spoken and in T-unit length occurred between the same grade levels.

Total Number of T-Units

A second measure of the volubility of language is the total number of T-units used per sample. A "T-unit" is defined as "one main clause with all the subordinate clauses attached to it" (Hunt, 1965, p. 20). Total number of T-units has been examined in several studies and would seem to increase with age.

Fox (1972) reported an increase in the total number of T-units across four grade levels (K to 3).

Loban (1963) tabulated the total number of communication units (very similar in definiton to T-units). He found that the number of units used increased from

kindergarten to Grade 6.

Braun (1969) found, in a study involving students from three different ethnic communities, that fourth graders used more T-units than first graders. He also found, however, that the fourth grade students in his study spoke a greater number of T-units than did the sixth grade students.

In a study of the oral language of first graders, Bougere (1968) calculated intercorrelations among language measures. She found that this measure of volubility, number of T-units, was not significantly related to measures of syntactic maturity (mean length of T-unit, ratio of subordinate clauses to T-units, and ratio of sentence-combining transformations to T-units).

Vocabulary

Vocabulary is most commonly evaluated by: (a) using vocabulary tests, (b) counting the number of different words per sample, (c) calculating type-token ratios, and (d) classifying words on the basis of frequency of use.

Vocabulary Tests

A wide variety of vocabulary tests has been used. To mention just a few: Yedinack (1949) used the Word

Meaning subtest of the Durrell-Sullivan Reading Capacity Test; Templin (1957) used the Ammons Full Range Picture Vocabulary Test and the Seashore-Eckerson English Recognition Vocabulary Test; Loban (1963) used a modified version of the kindergarten vocabulary test devised by Watts; and Melear (1974) used the Peabody Picture Vocabulary Test.

Bougere (1968) noted that scores on such tests do not correlate as highly with other measures of oral language as does the number of different words produced in a language sample.

Number of Different Words

Studies of oral language prior to 1960 frequently used number of different words per sample as a measure of vocabulary.

Mean number of different words per sample was found to increase steadily with both chronological age (18 to 54 months) and mental age, in a study by McCarthy (1930).

Templin (1957) reported that the number of different words per 50 verbalizations increased steadily and significantly from age 3 to age 8.

Martin (1955) found a low positive correlation between number of different words and the Metropolitan Readiness Test scores of first grade children.

Type-Token Ratio

Most of the more recent investigations concerned with measuring vocabulary have calculated type-token ratios. The number of different words (types) is divided by the total number of words (tokens).

In using this ratio, it is necessary that the language samples to be compared be equal in size since the more words a person speaks, the more likely it is that he will use a word more than once and hence lower his type-token ratio. Loban (1963) achieved this equality by dividing his language samples into equal segments.

The more common way to negate the effect of unequal sample sizes on type-token ratio is to use the corrected formula derived by Carroll (1964): "number of different words divided by the square root of twice the number of words in the sample" (p. 54).

The corrected type-token ratio was used by Fox (1972) as a measure of "vocabulary diversity" (p. 492). She found that it increased across the four levels from kindergarten to Grade 3.

Ciani (1976) found that the corrected type-token ratio increased between Grades 1 and 3.

Bougere (1968), in her study of the oral language of first grade children, found type-token ratio (corrected) to be highly correlated with a measure of volubility: mean number of T-units per sample. She also

found a high positive relationship between type-token ratio and three measures of syntactic complexity: mean length of T-units, ratio of subordinate clauses to T-units, and ratio of sentence-combining transformations to T-units.

Frequency-of-Use Classifications

A fourth way of measuring vocabulary is to classify the words used according to the frequency with which they occur in the English language.

Thorndike and Lorge (1944) have classified 30,000 words according to their frequency of occurrence in written materials. Loban (1963) used these Thorndike-Lorge frequency levels to classify the oral vocabularies of first grade students. He found that high language ability students used about the same proportion of common words as low language children, fewer of the middle frequency range, and slightly more of the least common words.

Bougere (1968) also measured vocabulary by calculating percentages of words at different Thorndike-Lorge levels. She found that this vocabulary measure was not related to reading achievement, or to other measures of vocabulary, or to syntax.

Syntactic Complexity

A great many different ways to measure syntactic

complexity have been proposed. Indeed, it is true that "there are almost as many kinds of measure as there are language studies" (Shields & Steiner, 1973, p. 98). While it was far beyond the scope of this study to examine all of the numerous measures of syntax, eighteen of the more common ones are briefly reviewed.

Parts of Speech

The different parts of speech (nouns, verbs, adjectives, etc.) have been employed in a variety of ways in the study of oral language.

Templin (1957) determined the percentage of words in each of ten parts-of-speech categories relative to the total number of words. She found little change in the proportionate use of the various parts of speech across the ages of 3 to 8.

Hunt (1965) examined samples of written language, each of which were 1000 words in length, for parts of speech within T-units. He reported steady increases, from fourth to eighth to twelth grades, in the use of adjectives, adjectives with complements, and three auxiliary verbs (modals, "have", and "be"). The use of unmodified nouns and pronouns, and nonclause adverbs of time, place, and motion declined steadily over the eight year span.

In comparing the speech of normal and language-

delayed children, Davis and Seitz (1975) found that number of pronouns used per utterance distinguished between the two groups.

Ciani (1976) calculated a verb ratio: number of principal verbs excluding all "to be" forms divided by the number of sentences. He found that this verb ratio reflected a developmental trend from first to third grade and that it correlated as highly with age and mental maturity as did mean length of T-unit.

Developmental Sequence

A number of studies have employed measures which are based on the concept that the syntactic structures of a language are acquired in sequence.

Chomsky (1972) described five syntactic structures that are indicative of "five developmental stages in the acquisition of syntax" (p. 1). She found that linguistic stage, in the oral language of children between the ages of 6 and 10, was positively related to age, grade level, reading ability, and intelligence.

Menyuk (1963) examined the oral language of nursery school and first grade children. She found that some of the twenty-six types of transformations studied were used by all the children. Others were used significantly more by the first grade students than by the nursery school children while the reverse was never true.

Lee (1966) traced the development of three kinds of kernel sentences through four stages of development (referred to as "developmental sentence types"). She found that a child identified at the Northwestern University Speech Clinic as "language-delayed" used the earlier developmental sentence types more frequently than did a child with normally developing language.

Sentence Imitation Tests

Sentence imitation tests are based on the concept that a child will be better able to repeat those syntactic patterns which he uses correctly in spontaneous speech than those he has not yet mastered.

One example of a sentence imitation test is the Elicited Language Inventory (Carrow, 1974), designed to measure a wide range of traditional grammatical structures. Total errors on this test decrease significantly between the ages of 3-0 and 7-11. Another sentence imitation test is Fisher's Linguistic Structures Repetition Test (Fagan, Cooper, & Jensen, 1975).

Some sentence imitation tests have a receptive subtest in addition to the sentence repetition tasks. In the receptive portion of the test, the child must point to a picture, follow directions, or answer questions to indicate his understanding of the stimulus sentences. One test with this format is Fluharty's (1974) Speech

and Language Screening Test for Preschool Children, designed to assess mastery of various kernel sentence patterns and types of transformations. Fluharty (1974) reported a test-retest reliability coefficient of .97 and a criterion-related validity coefficient of ,87 for this instrument. Another test in this category is Fryburg's (1972) Test of Cognition.

The Imitation-Comprehension-Production Test by Fraser, Bellugi, and Brown requires not only comprehension and imitation but also production of contrasting features in paired sentences (Fagan, Bellugi, & Brown, 1975).

From this Imitation-Comprehension-Production Test, Lee (1960) developed the Northwestern Syntax Screening Test (NSST) for use with children between the ages of 3 and 8. The pairs of stimulus sentences in the NSST differ in terms of word order, function words, and morphological forms. In the receptive portion of the test, the child must identify, in each set of four pictures, the two which correspond to the given pair of sentences. In the expressive subtest, he must choose which of two stimulus sentences to repeat in conjunction with a picture indicated by the tester. Prutting, Gallagher, and Mulac (1975) found that 30% of the structures produced incorrectly on the NSST by preschool language-delayed students were produced correctly in

spontaneous speech samples. They thus concluded that Lee's test did not evaluate specific syntactic structures reliably and should be used only as a screening instrument for the initial identification of children with possible delays in language.

Proportion of Words in Garbles

False starts, word tangles, redundant subjects of sentences, and noncommunicative repetitions are often tabulated as "garbles". If the number of garbles or the proportion of words in garbles relative to total number of words were found to decrease with age, garbles might serve as a negative index of syntactic maturity. Research findings, while somewhat conflicting, have not, as a whole, shown such a pattern of decrease.

Harrell (1957) tabulated audible pauses, false starts, and repeated words and phrases. He found that the percentage of these unrelated words relative to total words decreased significantly between the ages of $9\frac{1}{2}$ and $15\frac{1}{2}$.

Loban (1963) tallied the percentage of words in mazes (false starts, meaningless repetitions, word tangles) in relation to the total number of words. Students rated "high" on language ability used smaller percentages of maze words than did the "low" language ability students. The percentage of words in mazes varied little

from grade to grade, however, and for any one group of students, was almost identical in Grade 1 and Grade 12.

Braun (1969) calculated the mean number of mazes per oral language sample. He found no clear relationship between the use of mazes and the grade level.

O'Donnell, Griffin, and Norris (1967) reported that the use of garbles increased (between kindergarten and Grade 2) before it decreased (between the second and seventh grades).

Fox (1972), who calculated number of words in garbles, also found an initial increase (between kindergarten and second grade) followed by a decrease (between Grades 2 and 3).

Incomplete Clausal Patterns

A few studies have examined the potential usefulness of incomplete clausal patterns as a negative index of syntactic maturity.

McCarthy (1930) tallied the number of functionally complete but structurally incomplete responses in the oral language of children between 18 and 54 months of age. Relative to total number of responses, structurally incomplete responses decreased with both age and ability.

Loban (1963) computed the percentage of total language in partial communication units. He found that partials were less often produced by high language

ability students and that, for both groups, the percentage of partial clauses decreased between kindergarten and Grade 6.

O'Donnell, Griffin, and Norris (1967) calculated the number of incomplete clausal patterns in speech per 100 T-units. They found a steady decrease from kindergarten to Grade 7.

Different Structural Patterns

A number of studies have attempted to determine whether or not there is an age-related increase in the use of certain structural patterns of main clauses.

Loban (1963) analyzed oral language samples with respect to the percentage of total language in each of six structural patterns. He did not find that any of the patterns varied systematically with grade level from kindergarten to Grade 6.

Braun (1969) studied the mean frequencies of six main-clause patterns in the oral language of first, fourth, and sixth grade students. Five patterns (subject-verb, subject-verb-object, subject-verb-adjective-complement, subject-verb-indirect object-direct object, and subject-verb-complement) were positively related to grade level with respect to their frequency of use. Only one pattern (subject-verb-object), however, was significantly related to both grade and ability levels.

Klassen (1969), in a study of written language, found the subject-verb-complement pattern to be related to both grade and ability.

O'Donnell, Griffin, and Norris (1967) also investigated the structural patterns of main clauses. Of the eleven patterns studied, all were used in speech by seventh graders "at about the same rate as they had been used in kindergarten with one exception" (p. 88). The use of predicate nominals following linking verbs (e.g., It was a dog.) decreased radically between kindergarten and first grade and continued to decrease gradually from Grade 2 to Grade 7.

Mean Words per Clause

Several recent investigations have reported that clause length increases with age.

In a 1969 study of the oral language of first, fourth, and sixth grade students, Braun found that mean clause length increased with grade level.

Klassen (1969), studying written language, found that mean clause length increased from Grade 4 to Grade 6.

Hunt's (1970) study of written language reported that clause length increased significantly with both age and ability. He stated that while clause length "moves with glacial slowness in the early grades" (p. 18),

studies covering a wide age span can detect its steady increase.

Ratio of Dependent Clauses to Independent Clauses

Dividing the number of dependent clauses by the number of independent clauses yields a subordinate clause ratio.

This ratio was found by Harrell (1957) to increase between the ages of $9\frac{1}{2}$ and $15\frac{1}{2}$.

Loban (1976) also calculated the average number of dependent clauses per main clause in the oral language sample. He reported that high language ability students produced more dependent clauses per unit at every grade level and that the mean number of dependent clauses per unit increased steadily from Grade 1 to Grade 12.

Mean Clauses per T-Unit

Highly similar to the subordinate clause ratio is the subordinate clause index. This index is the mean number of clauses per T-unit and is calculated by dividing the total number of all clauses by the total number of main clauses.

Braun (1969) determined mean clauses per T-unit in the oral language of first, fourth, and sixth grade students. He found that the ratio increased with grade level.

In a study of written language, Hunt (1965) found an increase in the subordinate clause index from fourth to eighth to twelth grade.

Mean Words per T-Unit

Numerous studies have reported findings that support the use of average number of words per T-unit as an indicator of syntactic complexity.

Fox (1972) noted a significant increase in mean words per T-unit over four grade levels (K to 3).

Ciani (1976) reported a significant increase in mean T-unit length between Grades 1 and 3.

O'Donnell, Griffin, and Norris (1967) found that the mean length of T-units in oral language samples, obtained from kindergarten, first, second, third, fifth, and seventh grade children, increased "without exception... from grade to grade" (p. 44). They concluded that mean length of T-units was a "sensitive measure of development toward maturity in children's language production" (p. 44).

Loban (1976) reported that high language ability students used longer communication units (very similar in definition to T-units) than did low language ability students. In addition, mean length increased steadily from Grades 1 to 12. Loban stated that, in his study, high mean numbers of words per unit were accompanied by

"more effective use of phrases and clauses, and by the increased use of other forms of elaboration contributing to clear and meaningful communication" (pp. 25, 26).

Braun (1969), in a study of oral language, found that mean T-unit length increased from Grade 1 to Grade 6 and from low to high ability levels.

Hunt (1970) found that, in samples of written language, T-unit length increased both with age and ability.

Klassen (1969) also reported that mean length of T-unit increased with both grade and ability.

Further support for mean length of T-unit is provided by Hunt's (1965) contingency coefficient analysis of four indices. He found T-unit length to be the best indicator of grade level. (The remaining three indices ranked as follows: clause length, subordination ratio, and sentence length.)

In a study of the oral language of first grade students, Bougere (1968) found that length of T-unit was closely related to subordinate clauses per T-unit and to sentence combining transformations per T-unit. She stated that this close relationship between T-unit length and two other measures of syntactic maturity supports the conclusion reached by Hunt (1965) and O'Donnell, Griffin, and Norris (1967): mean length of T-unit is a valid index of syntactic complexity.

The inter-test reliability of mean T-unit length

was measured by Klassen (1976). Two samples of written language were obtained from each of 24 elementary students in response to similar eliciting stimuli. A positive correlation of .82 was found between the mean T-unit lengths of the two sets of language samples.

Klassen (1976) also examined the inter-rater reliability of the T-unit. Written language samples of elementary students, totalling over 3000 words, were given to five independent raters. The highly uniform results attest "to the countability of T-units and the possibility of their unambiguous delineation" (Klassen, 1976, p.47).

Proportion of "Short" T-Units

The number of T-units less than nine words relative to the total number of T-units, has been calculated by several investigators.

O'Donnell, Griffin, and Norris (1967) found that the proportion of "short" T-units in oral language decreased steadily from kindergarten to Grade 7.

In a study of written language, Hunt (1965) reported that the number of "short" T-units decreased from Grades 4 to 8 to 12. Futhermore, he concluded on the basis of a contingency analysis, that the number of "short" T-units "is as good an indicator of grade as any yet devised" (p. 29).

Mean T-units per Sentence

Hunt (1965) observed that the sensitivity of sentence length as a measure of syntactic maturity is reduced by the tendency of young children to string main clauses together "endlessly with and after and" (p. 22).

To show the degree of this coordination between main clauses, Hunt (1970) calculated the mean number of T-units per sentence (main clause coordination index). He found that it decreased from Grade 4 to Grade 12 and that high ability students wrote fewer T-units per sentence than did low ability students.

Proportion of T-Units Introduced by Coordinating Conjunctions

Another way to measure the amount of coordination between main clauses is to calculate the proportion of T-units introduced by coordinating conjunctions (and, but, so, or). Research findings concerning this measure of coordination have been inconclusive.

Hunt (1965) reported a steady decline from Grades 4 to 8 to 12 in the use of coordinators between main clauses in written language.

O'Donnell, Griffin, and Norris (1967) calculated the incidence of initial coordinating conjunctions per 100 T-units in oral language samples. They found that

the rate of occurrence increased from kindergarten to Grade 5 and then decreased somewhat between the fifth and seventh grades.

Braun (1969) found that his fourth grade students began more T-units with coordinating conjunctions than did his first and sixth grade students. (In considering this finding it must be remembered that Braun's fourth grade students produced the greatest mean number of T-units per oral language sample.)

A study of written language by Klassen (1969) failed to find a relationship between number of T-units beginning with coordinating conjunctions and either grade level or ability.

Mean Words per Response

A "response" is defined as an expression "marked off from preceding and succeeding remarks by pauses" (McCarthy, 1930, p. 32). Mean length of response has been used extensively as a measure of language development.

McCarthy (1930) found a steady increase in mean length of response from 18 to 54 months of age. She also reported a positive relationship between mean length of response and ability (mental age).

Templin (1957) reported steady increases in response length between the ages of 3 and 8.

In a 1966 review of oral language studies, McCarthy cites ten other investigations which reported an increase in length of sentence with age.

Shields and Steiner (1973) calculated the mean length of response both with and without including one and two word utterances. They found that both measures of response length increased between the ages of 3-6 and 4-11.

Additional support for mean length of response is provided by studies which show response length to be positively correlated with other language measures. Yedinack (1949) reported that length of response correlated positively with completeness and complexity of response. Shriner (1967) found mean length of response to be the best predictor of psychological scale values of language development in children between the ages of 3 and 5. Wilson (1969) showed words per sentence to have a high positive correlation with judges' rankings on vocabulary and syntax scales. Sharf (1972) found mean length of response to be closely related to Shriner's length-complexity index and to Lee's developmental sentence types.

Hunt (1970), on the other hand, in his analysis of stories written by fourth, sixth, eighth, tenth, and twelth grade students, found that "older students do write longer sentences" (pl 16), but that the sentence

length index is unreliable. (He found, for example, that sixth grade students wrote shorter sentences than did fourth grade students and, at Grades 4 and 6, low ability students wrote longer sentences than did high ability students.)

Mean Number of Sentence-Combining Transformations per T-Unit

Several investigations have calculated the average number of sentence-combining transformations per T-unit.

O'Donnell, Griffin, and Norris (1967) found that the mean number of sentence-combining transformations per T-unit in oral language samples increased with each successive grade level (K to 7).

Klassen (1969) calculated the number of sentence-combining transformations per sample of written language. He found that the frequency of sentence-combining transformations per sample of written language increased with grade and ability.

Braun (1967) found, in oral language samples, that the number of sentence-combining transformations increased from low to high ability levels.

Types of Sentence-Combining Transformations

A number of investigations of oral and written

language have examined the rate of occurrence of the different types of sentence-combining transformations. In these studies, all the types of sentence-combining transformations, with the exception of coordinating conjunctions between independent predications (which are tabulated separately), were classified under three headings: "(1) those producing nominal constructions, (2) those producing adverbial constructions, and (3) those producing coordinate constructions within T-units" (O'Donnell, Griffin, and Norris, 1967, p. 35).

The results of the various studies have given rise to somewhat different conclusions as to which of the sentence-combining transformations are the most "significant indicators of syntactic growth" (Klassen, 1976, p. 77). When the findings of the various studies are examined together, there would appear to be a fairly substantial degree of agreement concerning four of the sentence-combining transformations in particular. These four include nouns modified by prepositional phrases, adjective clauses, noun clauses, and adverbial clauses.

Nouns modified by prepositional phrases. An example of a noun modified by a prepositional phrase is "fish with a red fin".

Hunt (1965) found that the frequency with which

nouns modified by prepositional phrases were used in equal-length samples of written language increased significantly from Grade 4 to Grade 8 to Grade 12.

Sixth grade students, in a study by Klassen (1969) used significantly more nouns modified by prepositional phrases in their written stories than did fourth grade students.

In the study of oral language by O'Donnell, Griffin, and Norris (1967), the rate of occurrence of the noun plus prepositional phrase constructions per 100 T-units increased, with fluctuations, between kindergarten and Grade 5 and then made a significant increment between the fifth and seventh grades.

Adjective clauses. An example of an adjective clause is underlined in the following sentence: "The cat chases the bird that nests in the oak tree."

Templin (1957) found that the use of adjective clauses in oral language increased nearly twelve times between the ages of 3 and 8.

Harrell (1957) reported an increase in use of adjective clauses between the ages of $9\frac{1}{2}$ and $15\frac{1}{2}$.

Loban (1976) found that high language ability students produced more adjective clauses than did low language ability students and that the use of adjective clauses in speech increased steadily from first to ninth grade.

In a study of written language, Hunt (1965) noted that number of adjective clauses increased steadily and significantly from fourth to eighth to twelth grade. So impressive is this growth that Hunt concluded that this increase in the use of adjective clauses accounts for most of the increase seen in the subordinate clause ratio over age (Hunt, 1966).

Klassen (1969) found that sixth grade students used a significantly greater number of noun plus relative clause constructions in their written language than did fourth grade students.

O'Donnell, Griffin, and Norris (1967), however, did not find that the use, in oral language, of nouns plus relative clauses, calculated per 100 T-units, increased from kindergarten to Grade 7.

Noun clauses. An example of a noun clause is given in the underlined portion of the following sentence. "The dog saw the boy was leaving."

Templin (1957) reported that the number of noun clauses used in oral language increased seven times between the ages of 3 and 8.

Harrell (1957) noted a steady increase in the use of noun clauses from $9\frac{1}{2}$ to $15\frac{1}{2}$ years of age.

O'Donnell, Griffin, and Norris (1967) found that, in the speech of students in kindergarten to Grade 7,

the rate of occurrence of noun clauses underwent a gradual, fluctuating increase.

Loban (1976) reported that high language ability students used more noun clauses in speech than did low language ability students, at every grade level. He also found an overall increase in the use of noun clauses from Grade 1 to Grade 12.

In a study of written language, Hunt (1965) noted a significant increase in the use of noun clauses from Grades 4 to 8 to 12.

In Klassen's (1969) study of the written language of fourth and sixth grade children, no significant relationship between use of noun clause and grade level was found but the number of noun clauses used was positively related to level of ability.

Adverbial clauses. An example of an adverb clause is underlined in the following sentence. "The child cried when the bee stung her."

Templin (1957) reported that the use of adverbial clauses in oral language increased four times between the ages of 3 and 8.

Harrell (1957) found a fluctuating increase in the use of adverb clauses between the ages of $9\frac{1}{2}$ and $15\frac{1}{2}$.

O'Donnell, Griffin, and Norris (1967) noted a

gradual increase in the rate of occurrence of adverbial clauses between kindergarten and the seventh grade.

Loban (1976) found that high language ability students used more adverbial clauses than did low language ability students and that, for both groups, there was a steady increase in the use of adverbial clauses from Grades 1 to 12.

In a study of written language, Hunt (1965) noted that older students tended to use more adverb clauses but that the increase in use from Grade 4 to 8 to 12 was not significant.

Klassen (1969) found the use of adverb clauses in written language samples to be related to ability but not to grade.

Functions of Sentence-Combining Transformations

Several investigations of oral and written language have examined the types of sentence-combining transformations in terms of the grammatical functions they perform.

Loban's (1963) study of the various functions of nominals did not reveal any trends from kindergarten to Grade 6. He did note that high language ability students used more of the complicated constructions than did low language ability students.

Hunt (1965), in a study of written language, found that the ability to use noun clauses in positions other

than direct objects increased with grade level.

O'Donnell, Griffin, and Norris (1967) noted, in their examination of the functions of sentence-combining transformations, that the most steady and impressive increase from kindergarten to Grade 7 occurred in the use of nominals as objects of prepositions. They stated that, on the whole, their analysis of the functions of sentence-combining transformations was less revealing than was their examination of the types.

Derived Indices of Syntactic Maturity

Several researchers in the field of language have attempted to combine a number of measures of syntactic complexity into a single index.

Shriner and Sherman (1967) have derived a length-complexity index which incorporates four measures of language development: mean of the five longest responses, number of one-word responses, number of different words, and a structural complexity score. Shriner (1967) reported that this index proved to be a good predictor of psychological scale values of language development for children under five but that it became imprecise when "applied to longer and more complex sentences" (p. 833). (The psychological scale values used were derived from the results obtained when 104 judges rated transcribed language samples on an equal-appearing intervals scale

of language development.) Shriner (1967) noted that the length-complexity index is a preliminary measure and that further research on it is required.

A second derived index is the Endicott Syntactic Scale (O'Donnell, 1976). This scale attempts to take into account number of words, inflection of words, syntactic operations, and use of transformations.

A third derived index is Golub's Syntactic Density Score (O'Donnell, 1976). This score is based on ten measures: "words per T-unit, subordinate clauses per T-unit, words per main clause, words per subordinate clause, number of modals, number of 'be' and 'have' forms, number of prepositional phrases, number of possessives, number of adverbs of time, and number of gerunds, participles and unbound modifiers" (O'Donnell, 1976, pp. 35, 36).

In his examination of the indices derived by Endicott and Golub, O'Donnell (1976) noted that these measures attempt to discriminate among different syntactic constructions. He stated, however, that they are "rather complex and expensive procedures" (p. 38) in comparison to T-unit length, and that more research is still needed to determine how consistently they measure structural complexity in a variety of situations.

Sociometric Testing

The term, "popularity", means different things to

different people. One common way to define popularity is by peer-determined social status. Methods of calculating the social status of individuals on the basis of peer-selection rating are called sociometric techniques.

Since the introduction of sociometry by Moreno between 1923 and 1934, a wide variety of sociometric techniques have been devised.

One type of sociometric measure requires the child to point to the individual he likes best each time he is presented with photographs of two of his classmates (Burns, 1974).

In another kind of sociometric technique, the student is given an alphabetical list of his classmates with three sets of line drawings below each name. The drawings depict two children playing together, two children playing alongside each other, and one child playing with his back to the other one. The student is asked to indicate his feeling by circling one of the three sets of drawings for each of his classmates (Bruininks, Rynders, & Gross, 1974).

If the group is small, the child may be given an alphabetical list of his fellow members and be asked to rank them from most preferred to least preferred (Kerlinger, 1973) or from the extremes (most preferred, least preferred, next most, next least, etc.) (Gronlund & Barns, 1956).

A fourth type of sociometric technique makes use of the class play (Cotler & Palmer, 1970). Twenty roles are described and the child is asked to select the classmate he thinks best suits each role. Children chosen by many fellow students are said to be very visible. Individuals chosen often for positive roles are considered to be popular; those chosen frequently for negative roles are considered unpopular.

One sociometric technique asks the child to nominate the three most popular students in the room (Guardo, 1969).

Another technique requires the student to rate each of his classmates on certain criteria. One such measure, The Friendship Rating Scale (Bailey & Pierce, 1975) for example, asks the student to rate each of his peers on five criterion statements which describe positive attributes of friends. A five point rating scale is used, with five being the highest possible rating.

A myriad of other sociometric techniques exist in addition to these six. By far the most common one, however, is the Sociometric Test.

The Sociometric Test

The Sociometric Test was originated by Moreno in 1932 and has been developed and modified by

Bronfenbrenner (1945), Northway (1957), and Gronlund (1959). This measure requires the student to choose, from a defined group, a specific number of associates for a given activity or situation.

Construction. The format of the Sociometric Test can vary with respect to the criteria of selection used, the number of choices each child is asked to make, and the content of the directions given to the students.

Regarding the criteria of selection used, a number of authors (Jennings, 1951; Moreno, 1953; Northway, 1957; Thorpe, 1959) have noted the importance of using activity situations which are realistic and meaningful to the child. (If a class never goes on walking excursions together, such a choice criterion will be unlikely to elicit true responses.) The use of general rather than highly specific criteria has also been found to be advantageous (Gronlund, 1955).

With reference to the number of choices a child is asked to make, Bonney (1953) and Northway (1957) reported that children in first and second grade can make three choices discriminately. Students in third grade and beyond should probably be asked to make five choices since, for these students, sociometric status scores based on five choices show greater stability

over time than do scores based on three choices (Gronlund, 1955).

Directions should be clear, precise, and accompanied by the assurance that answers will be kept confidential and that test results will be put to some concrete use in the classroom (Gronlund, 1959; Northway, 1967).

Administration. A number of recommendations regarding the administration of the Sociometric Test have been made. Testing should not be done until five or six weeks after a group has been formed (Gronlund, 1959). The test should be administered to everyone on the same day if possible, and definitely within the same week (Northway, 1967). The test administrator should not be a total stranger, especially if very young children are being tested (Northway, 1957). A relaxed, natural tone of voice should be used. Questions asked by the children should be answered and sufficient time should be allowed for each child to respond fully (Thorpe, 1959). Testing of primary school children should be done individually, with the administrator recording the answers (Northway, 1967).

Analysis of test results. The four most common ways to analyze and summarize Sociometric Test results are the sociometric matrix, summary tables, the sociogram, and the social status index.

A sociometric matrix is, basically, "a table in which the names of group members are listed in a column at the left, and also in the same order across the top, with choices made indicated in the appropriate cells" (Bowd, 1973-1974). Gronlund (1959) presents detailed, step by step guidelines for the construction of sociometric matrices.

From the sociometric matrix, summary tables are constructed. These tables show patterns such as distribution of choices, distribution of mutual choices, and interactions analyzed according to criteria.

A third method of analysis involves the construction and examination of a sociogram. A sociogram is a graphic picture of test results. Gronlund (1959) gives a detailed description of a Northway-Bronfenbrenner target sociogram.

A fourth way to analyze Sociometric Test results is to calculate social status indices. Many such indices have been proposed. Lindzey and Byrne (1968) noted that it is possible to classify these various indices into three general categories: those based on the number of both positive and negative choices received, those based on the number of positive choices received but weighted for intensity of choice, and those based simply on the total number of positive choices received.

The use of social status indices which involve

both positive and negative choices has been questioned by Lindzey and Byrne (1968). Their objection is based on the fact that the relationship between acceptance and rejection choices has not yet been determined. They noted that, while acceptance and rejection are usually assumed to be inversely related, one study which examined the question found a positive correlation between number of positive choices and number of rejections received (Trent, in Lindzey and Byrne, 1968).

Using social status indices based on the number of positive choices received but weighted for intensity was also discouraged by Lindzey and Byrne (1968). They stated that the amount of investigation "at a theoretical level on the meaning of intensity of sociometric choices" (p. 466) was not sufficient to warrant the use of weighted choice indices.

A study by Gronlund (1955) also suggested that using weighted scores in the calculation of social status was not a very valuable practice. Gronlund (1955) found that, for students in Grades 4 to 6, social status scores weighted for intensity of choice were no more reliable over time than were unweighted scores based simply on total number of choices received.

The most frequently used social status indices are those based on the total number of positive choices received. (Usually only positive choices are invited.)

One such index is calculated by dividing the total number of choices received by the number of group members minus one. The assumption upon which this particular index is based has been criticized by Gronlund (1959). In his opinion, an individual in a larger group is not likely to receive more choices since, while there are more "choosers", there are also more people to be chosen. This line of reasoning is supported, to some extent at least, by the fact that total choices received has been shown to remain relatively stable (.67 to .72) over groups, even when those groups have varied in size from 30 to 340 members (Gronlund and Whitney in Gronlund, 1959). Gronlund (1959) concluded that "the total number of choices received or given should be used directly for within group and between group comparisons" (pp. 79, 80).

Having discussed the disadvantages inherent in positive/negative choice indices and in weighted choice indices, Lindzey and Byrne (1968) concurred with Gronlund in advocating that raw number of positive choices received be used in defining social status. They stated, furthermore, that use of this measure is appropriate when differences in sociometric status are being related to differences in other variables.

Reliability. The reliability of the Sociometric

Test has most frequently been measured by test-retest procedures. Gronlund (1959) reviewed sixteen studies which used this method to assess the stability of sociometric status in elementary and high school students. He noted that, although these investigations differed in the variations of the Sociometric Test and the testing procedures used, "a significant degree of stability" (p. 123) was reported by all studies. From his review, Gronlund (1959) concluded that test-retest reliability coefficients of about .90 could be expected over time periods of less than a week, .80 over several weeks, and .60 over intervals ranging from eight to twenty months.

Lindzey and Byrne (1968) also reviewed a large number of studies which measured the stability of sociometric results in children and adolescents. They too found that, over short intervals of time (less than a week), a high degree of consistency (over .90) was reported and that "even with relatively long time periods" (p. 477) of three months to three years, statistically significant reliability coefficients of .57 and .56 were obtained.

Of particular relevance to the present study is the fact that sociometric status scores of children in the primary grades have been shown to be relatively stable even over a period of several years. Gronlund (1959) reported a longitudinal study (by Bonney) which

began with second grade students. Stability coefficients of .67 to .84 were obtained between the successive grades from two to five. When these coefficients were compared to those calculated for intelligence and achievement test results, the sociometric status scores were found to be as stable as the intelligence and achievement scores.

Northway (1968), in a study in 1957, correlated sociometric scores obtained at the beginning of kindergarten and at the end of Grade 3. A reliability coefficent of .89 resulted, with "similarly high levels " (p. 55) "reached between intermediary points" (p. 55). In a second study, Northway (1968) used 2000 scores obtained from children in junior nursery to Grade 5. She found that, over any one-year period, scores correlated at the .001 level of significance. Futhermore, children's sociometric status in kindergarten was significantly related (at the .001 level) to their status in Grade 5. In a third study, Northway tested three groups of children, at one year intervals, from junior nursery to Grade 2. When the scores from the three groups were averaged, correlations similar to those found in the nursery-Grade 5 study were obtained. Northway (1968) concluded: "From these studies it has been found that children's sociometric status through nursery and elementary school shows a high level of stability" (p. 56).

Validity. Lindzey and Byrne (1968) noted that the appropriateness of assessing the validity of sociometric measures may be questioned in light of the fact that the conditions which affect overt choice behavior do not necessarily influence choice behavior on a sociometric measure. They nevertheless reviewed the various criterion-related validity studies which had been done. In nine of the eleven studies examined, sociometric choice was found to correlate, moderately highly, with overt behaviors such as choice of actual playmate, choice of seat, and election of captains, presidents, and chairmen.

Gronlund (1959) also reviewed a number of studies which assessed the relationship between the sociometric choosing and the actual behavior of school-age children. He found sociometric preferences to be significantly related (r = .76 to .80) to actual associations, and pupils with high sociometric status to be distinguishable "from those with low sociometric status by significant social behaviors" (p. 163).

Correlates of Sociometric Status

Many investigations have examined the relationship between sociometric status and other variables. While the findings are far from definitive, especially in areas which have received little attention, sociometric status has been shown to correlate positively with a variety of

traits and behaviors.

Studies have frequently reported a positive correlation between sociometric status and academic achievement. Teigland, Winkler, Munger, and Kranzler (1966) found that high achieving children in fourth grade were chosen by peers, as seat-, work-, and playmates, significantly more often than were underachievers.

Cotler and Palmer (1970) reported a relationship between sociometric status and achievement for girls in the fourth, fifth, and sixth grades.

In a study involving 3,917 students at the junior and senior high school levels, Muma (1965, 1968) found that level of sociometric status was positively correlated with academic achievement in both academic and performance classes.

Horowitz (1967), in a study of 2,942 high school students, found that the best predictor of sociometric status was achievement on an English test.

Sociometric status has also been shown to relate positively to interest in athletics. Barclay (1966) reported that fifth to ninth grade students with high sociometric status were more interested in studying and reading about sports than were their low sociometric status peers.

Horowitz (1967), studying high school students,

found an individual's interest in sports to be one of the three best predictors of his popularity. In addition, he found that knowledge of sports was a good predictor of sociometric status in males.

Some studies indicate a positive relationship between sociometric status and self-concept. Cotler and Palmer (1970) found that, for girls between the fourth and sixth grades, sociometric scores correlated positively with self-concept.

In a study of sixth grade students, Bradley and Newhouse (1975) found a high positive correlation between sociometric status and self-concept scores.

Howard, Stainback, and Stainback (1972) reported that peer acceptance bore a relatively close relationship to self-concept in a class of adolescent, educable mentally retarded students.

A variety of other variables have been correlated with sociometric status. In a study involving nursery school children, Moore and Updegraff (1964) identified a positive relationship between sociometric status and the observed use of nurturance-giving and dependency behaviors. Bonney and Powell (1953) found that highly acceptable first grade students demonstrated more conforming, cooperative, and outgoing behavior than did their less highly acceptable classmates. A unique study by Cox (1974) indicated that children between the ages of six and nine who perceived their parents' regard to be

positive had high sociometric status scores. McDavid and Harari (1966) determined that the popularity status of 10 to 12 year olds correlated positively with the possession of a popular name. A study of children in Grades 4 to 6 (Cheong, 1967) showed that students with positive attitudes toward teachers and school tended to have high sociometric status. Gallagher (1958) reported that second to fifth grade students with above average intelligence were chosen as friends significantly more often than children of average intelligence. Finally, Richards (1967) in a study involving children between the ages of 11 and 16, found a positive correlation between sociometric status and both personality stability and general intelligence.

Summary

Within this review of recent literature, five language sampling procedures and four types of stimuli frequently used to elicit oral language have been described. Two measures of volubility, four of vocabulary, and eighteen of syntactic complexity have been examined. Sociometric testing has been discussed with attention given to the construction, administration, analysis, reliability, and validity of the Sociometric Test as well as to some correlates of sociometric status.

The sociometric and language measures and procedures used in this study were chosen on the basis of this literature review.

Chapter 3

Procedures

Procedures for the study included the selection of subjects, the training of interviewers, the measurement of sociometric status, the measurement of oral language performance, and the analysis of data.

Selection of Subjects

The subjects were 36 students, 18 at each of two grade levels, who were selected at random from the total group of 116 first and second grade children. The subjects had a mean chronological age of six years eleven months and were attending a public elementary school. The school was organized on a multi-age basis, with Grade 1 and Grade 2 students being taught as a unit. The total enrollment of the school, kindergarten to Grade 8, was 455 students. All students lived within walking distance of the school, in a community which had no industry and no subsidized low-cost housing. The school had been built three years previously as part of the development of this new, Winnipeg suburb.

Training of Interviewers

Several of the most widely acclaimed of recent oral language studies have used trained interviewers: Loban (1963), O'Donnell, Griffin, and Norris (1967), Shriner and Sherman (1967). The present study employed three female interviewers, all of whom were certified, experienced elementary teachers who were not teaching during the 1977-78 school year. All three had elementary-school-age children of their own.

The training of the interviewers was conducted by the writer in the week prior to the testing. The first part of the training program involved a discussion and demonstration of the procedures to be followed in administering the Sociometric Test and in collecting the language samples. Each interviewer was given a Schedule of Instructions for the Sociometric Test Interview (See Appendix A) and a Schedule of Instructions for the Language Sample Interview (See Appendix B). The procedures were discussed point by point, and then demonstrated by the writer. The techniques to be used during the two interviews, described in the final paragraph on each of the schedules, were emphasized. Questions raised by the interviewers were explored.

The second segment of the training involved an

examination of the stimuli and equipment to be used. In relation to the sociometric testing, the interviewers read and discussed the Sociometric Test Directions (See Appendix C) and learned how to complete the Sociometric Test Record Sheet (See Appendix D). The stimuli for eliciting oral language were discussed with respect to the format and order of the picture charts and the content of the colored film. The interviewers learned to use the tape recorder and its remote switch as well as the film projector with its volume control turned off.

The final aspect of the training program involved practice in using the Sociometric Test and the language sampling techniques. Each of the interviewers administered the Sociometric Test and used the language sampling procedures with a Grade 2 student who was not a member of the study's population.

Observing the interviewers during this practice session, and later listening critically to the tape-recorded language samples, the writer noted that all three handled the mechanical aspects of the interviewing smoothly and followed the schedules of instructions closely. (They used the prescribed statements to elicit oral language. They paused between these statements. They did not offer their opinions, and they used non-prompting statements of encouragement, such as "mmm",

"yes", "good", as equally as possible with all children.) Futhermore, all three interviewers demonstrated affection and concern for the children they interviewed by a friendly, encouraging tone of voice, frequent use of the child's name, and empathic handling of extraneous comments about such things as Kleenex and gym class.

In addition to training, prior to the testing sessions the interviewers were given time in the classrooms to spend interacting with the students. The importance of establishing rapport between interviewers and subjects has been pointed out in both sociometric (Northway, 1967) and language (Farr, 1972) investigations.

Measurement of Sociometric Status

The Instrument

The instrument used to measure sociometric status was the Sociometric Test, originated by Moreno and developed by Bronfenbrenner (1945), Northway (1957), and Gronlund (1959). This test was chosen since it is the most frequently used and thoroughly researched of the social-choice measures. Moreover, as previously discussed in the literature review (See Chapter 2, pp. 56-58), it has been shown to have a relatively high degree of reliability (Gronlund, 1959; Lindzey & Byrne, 1968; Northway, 1968). It is easily administered and the

results yield readily to analysis for sociometric status.

Administration

The Sociometric Test was administered individually, in a private setting, to each child in the total group of first and second grade students. After having exchanged friendly greetings with the child, the interviewer read, in a pleasant and relaxed tone of voice, the Sociometric Test Directions (See Appendix C). The interviewer then proceeded to ask the child the questions to be found on the Sociometric Test Record Sheet (See Appendix D). The child's oral answers were recorded on the same form. Sufficient time was allowed for each child to respond fully to the questions.

The written schedule of procedures given to the interviewers appears in Appendix A.

Calculation of Sociometric Status

The results of the Sociometric Test were summarized on a matrix similar to the models presented by Gronlund (1959) and Northway (1957). This matrix was constructed by listing the Grade 1 and then the Grade 2 students, in alphabetical order, down the left side and then again across the top. The students on the left side were designated as the ones doing the choosing and those across

the top as being chosen. Each student made nine choices, three on each of the three criteria of selection--seating, word, and play. (A student could therefore choose as few as three different individuals or as many as nine.) Choices were recorded in appropriate cells.

The sociometric status scores of the 36 subjects were calculated by adding the total number of choices received. As advocated by Gronlund (1959) and Lindzey and Byrne (1968), (See Chapter 2, p. 56), each choice, whether a first, second, or third preference, was counted as one point in the calculation of sociometric status.

Measurement of Oral Language Performance

Measurement of oral language performance involved collecting and analyzing language samples.

Collecting the Language Samples

Equipment. The equipment used in the collection of the oral language samples consisted of a Singer Insta-Load 16 film projector, an inconspicuously located Sony TC 110 B cassette tape recorder with external microphone, digital counter, and remote on/off switch and indicator light, a table, a low desk, two chairs of equal height, and a quiet, visually-private room.

Stimuli. Two types of stimuli were used to elicit the oral language samples. (The advantage of using more than one type of stimulus has been previously discussed on page 18 of Chapter 2.)

One stimulus used was a set of eighteen colored 18" x 24" pictures from a set created to accompany the first level of a modern basal reading program. These pictures depicted events of high interest to young children and were designed to stimulate oral expression (Kambeitz, 1969).

The second type of stimuli used was a one-reel colored 16 millimeter film by Coronet. This film, previously used by Bougere (1968), Ciani (1976), Fox (1972), and O'Donnell, Griffin, and Norris (1967), portrayed an Aesop fable and was entitled "The Ant and the Dove".

Procedures. Each child was interviewed individually. The interviewer called the child from his classroom, greeted him, and told him they were going to see a movie and some pictures and then talk about them for a while. Prior to introducing the first stimulus, the interviewer conversed informally with the child on such topics of current interest as the on-going activity in the classroom, the fish in the display case aquarium, the student artwork in the halls, and the previous evening's television highlights.

The child was then seated in the viewing room and the interviewer introduced the film by saying, "We are going to show you a movie. It will be something like the cartoons you have seen on TV and something like some of the films you have seen at school. There is one thing about this movie that is different from TV and films, though. There is no sound or talking in this movie, so you will have to watch very carefully to see what is happening. We want you to watch carefully because, when the show is over, we want you to tell us what happened in the story. Will you do that for us? The name of the movie we are going to show you is 'The Ant and the Dove'. When the movie starts, watch closely and you will see the ant." Following the film the child was invited to go with the interviewer to talk about the movie and to see some pictures.

Once the child was seated in the interview room, and the tape recorder was turned on, the interviewer said to the child, "(Name), you just saw a movie about the ant and the dove. Tell me, any way you want to, what happened in the story." If the child hesitated for more than fifteen seconds or said that he could not remember the story, the interviewer said, once only, "You can just tell me anything you remember, any way you want to. Anything you tell me will be fine."

Following the child's response and a pause of about ten seconds, the interviewer said, "What else can you tell me about it?" After the child responded to this question, the interviewer said, "O.K. That was fine! Thank you for telling me the story. Now, do you think that this movie shows that when someone does something nice for you, you should do something nice for him?" If the child said, "Yes", the interviewer said, "Tell me how the film shows this." If the child answered, "No", the interviewer said, "Tell me why you don't think the film shows this." Following the child's response, the interviewer concluded by saying, "O.K. Fine! Thanks, (Name)!"

The series of pictures was presented next. The interviewer introduced the task by saying, "Now I'm going to show you some pictures." After displaying each picture the interviewer said, "Tell me a story about this picture." If the child hesitated for more than 15 seconds or said that he did not know any story to tell, the interviewer said reassuringly, "I'm sure you can tell me a story about the picture." Following the child's response and a pause of about ten seconds, the interviewer invited continued verbalization by asking, "What else is happening in the picture?" After the child's answer to this question and a pause of about ten seconds, the interviewer said, "Tell me what you think will happen next." If the child responded to this last request by saying, "I don't

know", the interviewer said, once only, "Tell me what you think will happen."

Throughout the language sample interview, the interviewer avoided using any statements other than the prescribed ones to elicit oral language. She did not offer her opinion or comment at length on the student's responses. In her use of non-prompting comments of encouragement (such as "mmm", "yes", "right", "good") she attempted to treat all children as equally as possible.

When the complete series of pictures had been presented, the interviewer complimented the child on his story-telling and thanked him for his cooperation. The tape-recorder was then turned off.

The written schedule of procedures which was given to the interviewers appears in Appendix B. A summary sheet containing only the stimulus statements can be found in Appendix E. The procedures used to obtain oral language samples in this study were based on those used by Bougere (1968) and O'Donnell, Griffin, and Norris (1967), with modifications being made on the basis of two pilot studies conducted by the writer.

In the first of these pilot studies, a trained interviewer and the writer administered the Sociometric Test to a group of 15 first and second grade students attending a summer education program in a suburb of

Winnipeg. Language samples were obtained from the three children, at each grade level, who were named by the group leaders as least talkative, average, and most talkative. The eliciting stimulus was a set of pictures which included those used in the present study. In the second of the pilot studies, four children between the ages of five and seven were shown the soundless film, "The Ant and the Dove", and were asked to respond to questions which pertained to it. From these two pilot studies, information was obtained about such aspects of language sampling as interviewer training, physical surroundings, equipment functioning, number and content of pictures, wording and order of prescribed statements, pause length, and use of statements of encouragement.

Analyzing the Language Samples

The tape-recorded language samples were transcribed verbatim by the interviewers. The guidelines followed in transcribing the samples incorporated those suggested by Engler, Hannah, and Longhurst (1973) as well as a number designed by the writer to facilitate later analysis. (These guidelines appear in the Schedule of Instructions for Transcribing the Language Samples found in Appendix F.) All passages of speech about which the transcribers were uncertain were marked for later consideration by the writer. In addition to re-transcribing these

unclear sections with the aid of amplification and high/low filtering, the writer checked the accuracy of transcription by verifying a random tenth of each language sample. Little disagreement (.73%) was found.

The transcribed oral language samples were analyzed in terms of two volubility measures, a measure of vocabulary, and four measures of syntactic complexity. The calculation of the volubility and vocabulary measures as well as of two of the four syntactic complexity measures was accomplished by the use of a computer program specifically designed for this study, in conjunction with hand analysis.

Volubility. One measure of volubility, total number of words, was obtained by counting all the words in the language sample, but excluding audible pauses and word segments. Following the procedure adopted by O'Donnell, Griffin, and Norris (1967), each contraction and each compound word was counted as two words.

Obtaining the second measure of volubility, total number of T-units, required a number of steps. First, audible pauses and garbles (false starts, redundant subjects, word-tangles, and noncommunicative repetitions) were eliminated. Attention claimers, such as "well", "now", "and", "you see", were not excluded, however (O'Donnell, Griffin, & Norris, 1967).

Next, the language samples were segmented into T-units (single independent predications with their related subordinate clauses). In identifying T-units, coordinating conjunctions between main clauses and "speaker tags" sometimes present difficulty. In the present study, a coordinating conjunction between two T-units was classified as part of the second T-unit. A "speaker tag" and the first expression after the speaker tag were counted as one T-unit (O'Hare, 1973). (For example, The boy said, "I have a mouse. It is grey." would have been tabulated as two T-units, the second one beginning with "It".)

Finally, the total number of T-units was counted.

Vocabulary. The measure of vocabulary diversity, type-token ratio, was calculated by counting the number of different words (types), and then dividing that figure by the square root of twice the total number of words (tokens) (Carroll, 1964).

This corrected type-token ratio was chosen since (a) it increases with age (Fox, 1972), (b) it incorporates the measure most frequently used prior to 1960--number of different words per sample (McCarthy, 1930; Templin, 1957; Martin, 1955), and (c) it correlates positively with volubility and syntactic complexity measures (Bougere, 1968).

Syntactic complexity. Four measures of syntactic complexity were obtained from the language samples: (a) mean words per T-unit, (b) proportion of "short" T-units, (c) number of nouns modified by prepositional phrases per 100 T-units, and (d) number of noun clauses per 100 T-units.

The first measure, mean words per T-unit, was calculated by dividing the total number of words in the T-units by the total number of T-units.

Mean length of T-unit was chosen as a measure of syntactic complexity for a number of reasons. As has been seen in Chapter 2 (p. 39), the T-unit circumvents the distortion caused to mean sentence length by the excessive use of "and" in the speech of young children (Hunt, 1965). Klassen (1976) and O'Donnell, Griffin, and Norris (1967) have demonstrated that language can be easily and accurately segmented into T-units. Furthermore, mean words per T-unit has repeatedly been shown to increase with age (Braun, 1969; Ciani, 1976; Fox, 1972; Hunt, 1970; Klassen, 1969; O'Donnell, Griffin, and Norris, 1967). The inter-test reliability of mean T-unit length has been found to be high (r = .82 in a study by Klassen, 1976). Finally, T-unit length has been shown to correlate highly with other measures of language development (Bougere, 1968).

The second measure of syntactic complexity calculated was the percentage of T-units less than nine words relative to the total number of T-units. This proportion of "short" T-units has been shown by O'Donnell, Griffin, and Norris (1967) and Hunt (1965) to be a negative index of syntactic complexity.

The third measure of syntactic complexity was obtained by counting the number of nouns modified by prepositional phrases and computing their rate of occurrence per 100 T-units.

The fourth measure involved calculating the number of noun clauses per 100 T-units.

Number of nouns modified by prepositional phrases per 100 T-units and number of noun clauses per 100 T-units were chosen as measures of syntactic complexity because of the substantial agreement among researchers regarding their relationship to age (Harrell, 1957; Hunt, 1965; Loban, 1976; O'Donnell, Griffin, & Norris, 1967; Templin, 1957). A further consideration in their choice was the fact that nouns modified by prepositional phrases and noun clauses have been shown to occur relatively frequently at the first and second grade levels (Loban, 1976; O'Donnell, Griffin, & Norris, 1967).

Analysis of Data

Results of the study were analyzed by calculating and comparing correlation coefficients.

Pearson product-moment correlation coefficients were calculated to determine the degree of relationship between sociometric status and each of the following: (a) total number of words, (b) total number of T-units, (c) type-token ratio (corrected), (d) mean number of words per T-unit, (e) proportion of "short" T-units, (f) number of nouns modified by prepositional phrases per 100 T-units, and (g) number of noun clauses per 100 T-units.

Chapter 4

Results and Discussion

The data obtained in this study consisted of a sociometric status score, two measures of volubility, one of vocabulary, and four of syntactic complexity, for each of the 36 subjects. (See Appendix G.) Means and measures of variation were calculated for these eight scores. Product-moment correlations were computed among the oral language measures and also between sociometric status and each of the language measures.

Sociometric Status Scores

The results of the Sociometric Test, administered to the total group of first and second grade students, are summarized on a sociometric matrix. An explanation of this matrix constitutes Appendix H and the matrix itself appears in Appendix I.

The sociometric status scores of the 36 subjects were calculated by adding the total number of choices received. The mean, range, and standard deviation for these sociometric scores appear in Table 1.

Table 1

Descriptive Statistics for Sociometric Status

Measure	Mean	Min.-Max.	Standard Deviation
Sociometric status	9.36	1-23	5.76

Bronfenbrenner (in Gronlund, 1959) noted that, when students are allowed three choices on each of three sociometric criteria, the statistically expected value of the sociometric status is 9. The mean sociometric status obtained in this study (9.36) lies close to this expectation.

Oral Language Measures

Analysis of the transcribed language samples yielded measures in three areas of oral language: volubility, vocabulary, and syntactic complexity.

Volubility

Two measures of volubility were calculated from

each language sample: total number of words and total number of T-units. The means of the volubility scores as well as two measures of variation are shown in Table 2.

Table 2

Descriptive Statistics for Volubility Measures

Volubility Measure	Mean	Min.-Max.	Standard Deviation
Total number of words	2074.5	410-6554	1533.4
Total number of T-units	254.7	63-736	162.9

A number of other studies (Bougere, 1968; Braun, 1969; Ciani, 1976; Fox, 1972; Loban, 1963; O'Donnell, Griffin, & Norris, 1967) have also measured the volubility of young children's oral language. Table 3 provides information on the comparability of these studies and allows a comparison of their volubility findings with those of the present investigation.

Table 3

Studies Measuring Volubility of Oral Language

Studies	Grade level of subjects	Location of subjects	Number of subjects	Language sampling stimuli	Language sampling procedures	Mean of total number of words	Mean of total number of T-units
Bougere, 1968	1	suburb of Chicago	60	-2 soundless films: "The Ant and the Dove" and "The Northwind and the Sun" -a series of pictures from a basal reader	adult/child interview with prescribed statements to elicit oral language	—	63.5
Braun, 1969	1	nine rural Manitoba communities	24	-1 filmstrip: "The Fisherman and his Wife" -1 soundless film: "Three Little Bruins in a Canoe"	adult/child interview with prescribed statements to elicit oral language	—	23.21
Ciani, 1976	1,2	rural mid-western community of less than 2500 people	40	-2 soundless films: "The Ant and the Dove" and "The Northwind and the Sun"	adult/child interview with prescribed statements to elicit oral language	95	—
Fox, 1972	1,2	Salina, Kansas	40	-2 soundless films: "The Ant and the Dove" and "The Northwind and the Sun"	adult/child interview with prescribed statements to elicit oral language	480	—
Loban, 1963	1,2	Oakland, California	35	-a series of pictures	adult/child interview with most of the statements used to elicit oral language prescribed	599.83	97.75
O'Donnell, Griffin, & Norris, 1967	1,2	Murfreesbro, Tennessee	60	-2 soundless films: "The Ant and the Dove: and "The Northwind and the Sun"	adult/child interview with prescribed statements to elicit oral language	298.85	—
Present study	1,2	suburb of Winnipeg, Manitoba	36	-1 soundless film: "The Ant and the Dove" -a series of pictures from a basal reader	adult/child interview with prescribed statements to elicit oral language	2074.5	254.7

The characteristics of the subjects, the stimuli used to elicit language, and the language sampling procedures employed are three of the most important dimensions along which studies can vary. In Table 3, the first three columns provide information about the subjects. It can be seen that Bougere (1968) and Braun (1967) studied children in Grade 1 while the remaining five studies had subjects in both the first and second grade. (The time of year during which the children were interviewed varied: Fox, 1972, Loban, 1963, and O'Donnell, Griffin, and Norris, 1967, interviewed children in the spring; Bougere, 1968, and this writer obtained language samples during November.) The communities from which the subjects were drawn differed both in size and location. Number of subjects ranged from 24 to 60, with five studies having between 35 and 40.

The fourth column of Table 3 shows the various stimuli used to elicit oral language. Four studies (Ciani, 1976; Fox, 1972; Loban, 1963; O'Donnell, Griffin, & Norris, 1967) used a single type of stimulus while the remaining three (Bougere, 1968; Braun, 1969; and this investigation) used two different kinds. The present study resembled the investigations by Bougere (1968), Ciani (1976), Fox (1972), and O'Donnell, Griffin, and Norris (1967) in its use of the soundless film

entitled "The Ant and the Dove". It was similar to the studies by Bougere (1968) and Loban (1963) in its use of a series of pictures depicting events of interest to children.

Finally, the fifth column of Table 3 summarizes the procedures used to obtain the language samples. All seven studies used prescribed statements to elicit oral language, with Loban (1963) allowing his interviewers greater freedom to ask extra questions occasionally. The actual content, order, and number of the statements varied among the studies, primarily because of the differences in the stimuli being presented.

It should be noted that Loban's (1963) study also differed from the other six by virtue of being longitudinal. Futhermore, Loban (1963) analyzed language in communication units rather than in T-units. The communication unit is defined as "an independent clause between two silences" (Loban, 1963, p. 7). Communication units and T-units are not synonymous. (Fox example, "yes", as a one-word answer to a question, could be considered a communication unit but would usually be excluded when language is being segmented into T-units.) The two measures are, nevertheless, highly similar in practice since a simple or a complex sentence is counted both as one communication unit and as one T-unit, and a compound sentence with two main clauses constitutes two of either

unit.

Having noted the similarities and differences among these studies, one can proceed to compare their volubility findings with those of the present investigation. From the sixth and seventh columns of Table 3 it can be seen that this study's language samples were longer, both in words and T-units, than were those collected in the other investigations. The use of a greater number of eliciting stimuli no doubt accounts to a large degree for this disparity. The decision to use sufficient stimuli in order to elicit a language sample of at least 50 T-units from every subject was based on the finding by earlier investigators that 50 responses gave "a fairly representative sample of the child's stage of linguistic development in a relatively short period of time" (McCarthy, 1930, p. 32).

Vocabulary

The vocabulary diversity of each language sample was measured by comparing the number of different words (types) to the total number of words (tokens). The ratio used was corrected to control for the effect of differences in language sample sizes (Carroll, 1964). The mean of the type-token ratios and the variability within this set of measures are given in Table 4.

Table 4

Descriptive Statistics for the Vocabulary Measure

Measure	Mean	Min.-Max.	Standard Deviation
Type-token ratio	5.612	4.451-6.997	.694

Bougere (1968) and Ciani (1976) also measured vocabulary diversity by using the type-token ratio (corrected). Bougere (1968) reported a mean ratio of 4.7 in the language samples of first grade students. Ciani's (1976) mean type-token ratio for his first and second grade subjects was 3.4175. The present study's type-token ratio of 5.612 exceeds those reported by Bougere and Ciani.

Syntactic Complexity

Four measures of syntactic complexity were calculated for each language sample: mean number of words per T-unit, proportion of "short" T-units (T-units less than nine words in length), number of nouns modified by prepositional phrases per 100 T-units, and number of noun clauses per 100 T-units. The mean, range, and

standard deviation of each of these syntactic complexity measures are found in Table 5.

Table 5

Descriptive Statistics for Syntactic Complexity Measures

Measure	Mean	Min.-Max.	Standard Deviation
Mean length of T-unit	7.24	5.91-9.93	.98
Proportion of "short" T-units	74.38	39.21-94.50	11.73
Number of nouns modified by prep. phrases per 100 T-units	3.03	0-7.89	2.05
Number of noun clauses per 100 T-units	6.60	0-39.21	7.41

A number of studies (Bougere, 1968; Braun, 1969; Ciani, 1976; Fox, 1972; Loban, 1963; O'Donnell, Griffin, & Norris, 1967) have measured mean T-unit length as an index of syntactic complexity. Table 6 presents their findings in conjunction with those of the present study.

Table 6

Studies Measuring Mean Length of T-unit

Studies	Grade level of subjects	Mean number of words per T-unit
Bougere, 1968	1	7.6
Braun, 1969	1	6.84
Ciani, 1976	1,2	5.895
Fox, 1972	1,2	7.7
Loban, 1963	1,2	7.22[a]
O'Donnell, Griffin, & Norris, 1967	1,2	8.15
Present study	1,2	7.24

[a]Loban (1963) calculated mean number of words per "communication unit", a measure which is highly similar to the T-unit.

From Table 6 it can be seen that the mean T-unit lengths reported by these investigations varied, across the studies, from 5.895 to 8.15. Three studies reported mean T-unit lengths shorter than that found in the present study while three studies obtained average lengths which exceed it.

The other three syntactic complexity measures used in this study were also employed by O'Donnell, Griffin, and Norris (1967). The averages which they reported for two of these, number of nouns modified by prepositional phrases per 100 T-units (3.65) and number of noun clauses per 100 T-units (7.135), exceed those obtained by the present study. On the negative index of syntax--proportion of "short" T-units--their mean is lower. In considering this consistent superiority of the syntactic complexity scores obtained by O'Donnell, Griffin, and Norris (1967), it should be noted that their mean T-unit length was greater than that reported by any of the other five studies.

Intercorrelations of Language Measures

The interrelationships among the oral language measures were examined by correlating each of the seven language measures with the other six. These correlation coefficients appear in Table 7.

Table 7

Intercorrelations of Language Measures

Language measure	Total number of words	Total number of T-units	Type-token ratio (corrected)	Mean length of T-unit	Proportion of "short" T-units	Number of nouns modified by prep. phrases per 100 T-units	Number of noun clauses per 100 T-units
Total number of words							
Total number of T-units	0.97***						
Type-token ratio (corrected)	0.54***	0.54***					
Mean length of T-unit	0.60***	0.44**	0.36*				
Proportion of "short" T-units	-0.56***	-0.40**	-0.32*	-0.98***			
Number of nouns modified by prep. phrases per 100 T-units	0.62***	0.54***	0.59***	0.63***	-0.63***		
Number of noun clauses per 100 T-units	0.54***	0.41**	0.31*	0.66***	-0.70***	0.60***	

* significant beyond the .05 level of confidence
** significant beyond the .01 level of confidence
*** significant beyond the .001 level of confidence

Table 7 discloses information about five areas of correlation.

Correlation Between Volubility Measures

The two measures of volubility--total number of words per sample and total number of T-units per sample--correlated positively with each other (r = .97). The relationship was significant beyond the .001 level of confidence. This high positive correlation between the two volubility measures is as expected since most words spoken are organized in T-units.

Correlations Among Syntactic Complexity Measures

The intercorrelations among the four syntactic complexity measures can also be seen in Table 7.

Mean number of words per T-unit correlated negatively ($p < .001$) with the proportion of "short" T-units (r = -.98). Since the second of these measures--number of T-units less than nine words in length relative to the total number of T-units--is actually defined in terms of the first, this highly significant relationship is as expected.

Mean length of T-unit was positively related ($p < .001$) to the other two measures of syntactic complexity--number of nouns modified by prepositional phrases per

100 T-units (r = .63) and number of noun clauses per 100 T-units (r = .66).

Correspondingly, proportion of "short" T-units bore a significant ($p < .001$) negative relationship to nouns modified by prepositional phrases (r = -.63) and to noun clauses (r = -.70).

Finally, the relationship between number of nouns modified by prepositional phrases and number of noun clauses was positive (r = .60), beyond the .001 significance level.

Volubility/Vocabulary Correlations

Table 7 reveals that each of the volubility measures correlated positively with the measure of vocabulary diversity. The relationship between total number of words and the corrected type-token ratio (r = .54) was significant beyond the .001 level, as was the relationship between total number of T-units and type-token ratio (r = .54).

In her study of first grade students, Bougere (1968) also examined the intercorrelation among language measures. She too found a significant ($p < .01$) positive relationship between number of T-units and type-token ratio (corrected).

Volubility/Syntactic Complexity Correlations

The relationships between the volubility scores

and the syntactic complexity measures are also shown in Table 7. Total number of words per sample had a significant positive relationship to three of the measures of syntactic complexity: mean length of T-unit (r = .60), number of nouns modified by prepositional phrases per 100 T-units (r = .62), and number of noun clauses per 100 T-units (r = .54). Total number of words was negatively related to proportion of "short" T-units (r = -.56).

Similarly, total number of T-units correlated positively with T-unit length (r = .44), number of nouns modified by prepositional phrases (r = .56), and number of noun clauses (r = .41), and negatively with proportion of "short" T-units (r = -.40).

The findings of the present study differed from those of Bougere (1968) with respect to the existence of a relationship between volubility (as measured by number of T-units) and syntactic complexity (as measured by T-unit length). In discussing her results, Bougere (1968) noted that "a number of investigations have indicated that amount of language produced in a given situation is a fair measure of growth toward language mastery in preschool children" (p. 138). She stated that ordinary observation, however, did not seem to support this association between volubility and syntactic control, and she quoted O'Donnell, Griffin, and Norris's (1967) conclusion that total words should probably not

be regarded "very seriously as a measure of language mastery in school age children" (O'Donnell, Griffin, & Norris, 1967, p. 97).

O'Donnell, Griffin, and Norris (1967) did actually find that total number of words per sample increased steadily and significantly with grade level. They noted, however, that the greatest increments in total words used did not occur at the same grade levels as did the greatest increases in syntactic complexity (T-unit length). It was on this basis that they reached the conclusion cited by Bougere (1968).

Interestingly, Fox (1972), in a study designed to replicate the O'Donnell, Griffin, and Norris investigation, failed to find this disparity between the growth pattern of volubility and that of syntax. In contrast, Fox (1972) found that significant increases in total words occurred at the same grade levels as significant increments in T-unit length.

The differences in results between the O'Donnell, Griffin, and Norris (1967) study and the Fox (1972) investigation, as well as those between Bougere's (1968) study and the present one, make apparent the fact that the degree of relationship between the volubility and the syntactic complexity or oral language has not yet been established.

Vocabulary/Syntactic Complexity Correlations

Finally, Table 7 presents information regarding the relationship between vocabulary and syntactic complexity measures. The corrected type-token ratio correlated positively with mean length of T-unit (r = .36), number of nouns modified by prepositional phrases per 100 T-units (r = .59), and number of noun clauses per 100 T-units (r = .31). The relationship between type-token ratio and proportion of "short" T-units was negative (r = -.32). All correlations were significant beyond the .05 level.

Bougere (1968) also found this relationship between vocabulary (type-token ratio) and syntactic complexity (mean T-unit length).

Sociometric Status/Oral Language Relationship

The present study sought to determine whether or not a relationship existed between popularity (defined by peer choices on the Sociometric Test) and several aspects of oral language--volubility, vocabulary, and syntactic complexity. To satisfy this objective, correlations were calculated between sociometric status scores and each of seven language measures. These data are presented in Table 8.

Table 8

Relationship between Sociometric Status and Oral Language Measures

Language Measures	Sociometric Status
	r^a
Total number of words per sample	-0.09
Total number of T-units per sample	-0.02
Type-token ratio (corrected)	-0.09
Mean number of words per T-unit	-0.16
Proportion of "short" T-units	0.16
Number of nouns modified by prep. phrases per 100 T-units	-0.01
Number of noun clauses per 100 T-units	-0.21

[a]A correlation coefficient of .325 is significant at the .05 level for a two-tailed test of relationship.

Sociometric Status and Volubility

From Table 8 it can be seen that no significant relationship was found between sociometric status and either of the two measures of volubility--total number of words per sample or total number of T-units per

sample.

The few studies (Ahlbrand & Hudgins, 1970; Bonney & Powell, 1953; Slater, 1955) which have examined the relationship between popularity and volubility of oral language have inconclusive findings. Bonney and Powell (1953) found that first graders who were highly preferred as work and play mates made more voluntary contributions to groups than did their less highly preferred peers. They were not, however, observed to talk more to children or adults than were their less popular counterparts. Ahlbrand and Hudgins (1970) found that fourth to ninth grade students who were most frequently named by their peers as "popular" answered the most questions during class. Slater (1955), on the other hand, found that male college students who talked most during oral discussions were unlikely to be rated by their peers as "best liked".

Sociometric Status and Vocabulary

An examination of Table 8 reveals that sociometric status was not found to be significantly related to vocabulary diversity as measured by the corrected type-token ratio.

A comparison of this finding with the results of related studies is not possible since no previous research into the relationship between popularity and

vocabulary could be discovered.

Sociometric Status and Syntactic Complexity

From Table 8 it can be seen that sociometric status was not significantly related to any of the four measures of syntactic complexity--mean T-unit length, proportion of "short" T-units, number of nouns modified by prepositional phrases per 100 T-units, or number of noun clauses per 100 T-units.

Again, these results cannot be discussed with reference to previous investigations into the relationship between sociometric status and syntactic complexity since no such studies were found to exist.

Comparisons among Correlations

Since none of the sociometric status/language measures correlations were significant, comparisons among correlations to determine their relative strengths were unnecessary.

Chapter 5

Conclusions and Summary

It is commonly thought that people who speak well are more popular and are more likely to become leaders. Relatively few studies have been concerned with establishing the truth or falsehood of this assumption. Most of the research in this field has focused on the relationship between leadership and the volubility aspect of oral language performance (Ahlbrand & Hudgins, 1970; Goodenough, 1930; O'Connor, 1972; Slater, 1955; Wilson, 1971; Zeleny, 1939). In general, these investigations have shown leadership and volubility to be positively related. A small number of other studies (Ahlbrand & Hudgins, 1970; Bonney & Powell, 1953; Slater, 1955) have examined the relationship between popularity and the volubility of oral language, with inconclusive results. Investigations into the relationship between either popularity or leadership and aspects of oral language other than volubility are virtually nonexistent.

Because of this lack of research, the present study purposed to determine whether or not a relationship existed between popularity, as defined by peer choices on the Sociometric Test, and three aspects of

oral language. To satisfy this purpose, the study sought answers to eight questions, the first three of which dealt with the relationship between sociometric status and volubility, vocabulary, and syntactic complexity. The remaining five were concerned with determining whether sociometric status was more closely related to certain aspects of oral language than to others.

Sociometric Status and Volubility

The first question asked: "Is there a relationship between sociometric status and the volubility of oral language as measured by: (a) the total number of words per language sample, and (b) the total number of T-units per language sample?

No significant relationship between sociometric status and either measure of volubility was found.

The interpretation of this finding must, of course, take into consideration the delimitations of the study. The subjects were first and second grade students attending school in a newly developed suburb of a large city. The language samples were collected in one child-one adult interactions. Prescribed statements, in conjunction with a soundless film and a series of pictures, were used to elicit the oral language. (Reasons for

considering the characteristics of the subjects and the language sampling stimuli and procedures as delimitations of the study are discussed later in conjunction with suggestions for future research.)

Within the context of these delimitations, popularity was not shown to be related to the volubility of oral language.

Sociometric Status and Vocabulary

The second question to which the study addressed itself asked: "Is there a relationship between sociometric status and the vocabulary of oral language as measured by the type-token ratio (corrected)?"

Analysis of the study's data did not reveal any significant relationship between popularity and vocabulary. Again, this finding must be considered in relation to the characteristics of the subjects, and to the stimuli and procedures used to elicit the oral language samples.

Sociometric Status and Syntactic Complexity

The third question asked: "Is there a relationship between sociometric status and the syntactic complexity of oral language as measured by: (a) mean

number of words per T-unit, (b) proportion of "short" T-units, (c) number of nouns modified by prepositional phrases per 100 T-units, and (d) number of noun clauses per 100 T-units?"

When sociometric status scores were correlated with each of these syntactic complexity measures, no significant relationships were found. As with the previous two findings, these results must be considered in light of the delimitations of the study.

Comparisons among Correlations

The remaining five questions for which the study sought answers were concerned with determining whether sociometric status was more closely related to certain of the volubility, vocabulary, and syntactic complexity measures than to others. Since the language measures were shown to correlate highly with each other and to be unrelated to sociometric status, it was concluded that no significant differences existed among the relationships between sociometric status and the various oral language measures.

Suggestions for Future Research

Because so few studies have examined the

relationship between popularity/leadership and oral language performance, many questions remain to be answered.

1. Would a study which differed slightly from the present one report similar findings? A greater number of subjects could be used. (With 36 subjects, the correlation between sociometric status and any oral language measure must be at least .325 to be significant at the .05 level. If relationships of a smaller magnitude were of interest, a greater number of subjects would have to be used to determine whether or not these relationships existed.) A different film and/or series of pictures could be used to elicit oral language. (Cazden, 1970, reviewed three studies which found that the characteristics of the pictures presented were related to the volubility and/or syntactic complexity of the language obtained.) The prescribed statements could be altered. (A study by Shields and Steiner, 1973, indicated that the type of statements used can affect the syntactic complexity of language produced.)

2. If the subjects differed from those used in the present study with respect to socio-economic status, would the popularity/oral language relationship still fail to materialize? Subjects could be drawn, for example, from an inner city school or from three schools

judged to represent upper, middle, and lower income brackets. That the socio-economic status of the subjects could change the outcome of the study is suggested by two facts. First, the language used by children from lower income areas has repeatedly been shown to differ from the language employed by middle class children (Cazden, 1970). Secondly, the socio-economic status of an individual has been shown to influence the social choices he makes and perhaps to affect his sociometric status as well (Gronlund, 1959).

3. Would the use of different types of eliciting stimuli--such as filmstrips or toys--affect the results? The type of stimulus used has been shown to be related to the volubility and syntactic complexity of the language produced (Cazden, 1970).

4. If the language samples were obtained using a procedure other than free verbalization in an adult-child interview, would there still be no relationship between sociometric status and the volubility, vocabulary, and syntactic complexity of oral language? Indeed, in the literature, there is some suggestion that a change in this area might affect the study's findings. The investigations reporting a positive relationship between leadership and volubility obtained language samples through free play (Goodenough, 1930), class question-answer periods (Ahlbrand & Hudgins, 1970), and discussion

among peers (O'Connor, 1972; Slater, 1955; Wilson, 1971; Zeleny, 1939). A study which found a positive relationship between popularity and volubility (Ahlbrand & Hudgins, 1970) involved the use of a class question-answer period. In their examination of the popularity/volubility relationship, Bonney and Powell (1953) found that children most highly preferred by their peers did not talk more to adults or children in a free-play situation than did their less highly chosen peers, but they did make more voluntary contributions to group discussions.

5. If a study very similar to the present one were conducted at higher grade levels, would sociometric status and oral language still be found to be unrelated? The review of the literature revealed that almost all studies reporting a positive relationship between leadership or popularity and oral language (Ahlbrand & Hudgins, 1970; O'Connor, 1972; Slater, 1955; Wilson, 1971; Zeleny, 1939) have involved students in levels higher than grades one and two.

6. Would measuring popularity in terms other than sociometric status scores alter the results? While sociometric status is the most frequently used and thoroughly researched of the social-choice measures, it would be possible to assess popularity on the basis of some other sociometric technique. The one most frequently

used by the studies which found a positive relationship between leadership and oral language was "student nomination". Ahlbrand and Hudgins (1970), O'Connor (1972), Wilson (1971), Slater (1955), and Zeleny (1939) all asked their subjects to identify the actual leaders or the potentially best leaders from among their peers.

7. Would a study which used different measures of volubility, vocabulary, and syntactic complexity still report no relationship between popularity and oral language? In selecting the language measures for this study, the primary consideration was the extent of the research support which they had received. Several other measures, particularly in the area of syntactic complexity, looked promising and would no doubt be appropriate for use in popularity/oral language studies should they be further documented by research. Three such measures were Ciani's (1976) verb ratio, incomplete clausal patterns (McCarthy, 1930; Loban, 1963; O'Donnell, Griffin, & Norris, 1967), and Golub's Syntactic Density Score (O'Donnell, 1976).

8. Is leadership related to the vocabulary and syntactic complexity of oral language? Investigations into the relationship between leadership and oral language have focused on volubility. What would be the results of a study which correlated peer-rated leadership with all three facets of oral language?

To explore any one of these eight questions in depth would, of course, require many studies. The potential for research into the relationship between popularity/leadership and oral language performance is virtually unlimited.

Summary

This study sought to determine whether or not a relationship existed between popularity (as measured by peer choices on the Sociometric Test) and several aspects of oral language--volubility, vocabulary, and syntactic complexity.

The subjects were 36 first and second grade students. They were randomly selected from a total group of 116 children who were enrolled in a public K-8 school in a newly developed suburb of Winnipeg, Manitoba.

Three certified, experienced female teachers were trained as interviewers. Prior to the interviewing, they spent time in the classrooms interacting with the students.

To obtain a measure of the popularity of the subjects, the interviewers administered the Sociometric Test to each of the 116 children individually. (This Sociometric Test was originated by Moreno in 1932 and developed by Bronfenbrenner, 1945; Northway, 1957; and

Gronlund, 1959.) The sociometric status scores of the subjects were calculated by adding total number of peer choices received.

Samples of the subjects' oral language were gathered in one adult-one child interviews. Prescribed statements, in conjunction with a colored, soundless film ("The Ant and the Dove") and a series of pictures from a basal reading program, were used to elicit verbalization.

The language samples were tape recorded and transcribed verbatim. They were analyzed in terms of volubility, vocabulary, and syntactic complexity.

Volubility was measured by the total number of words per sample and the total number of T-units per sample. "T-unit" was defined as "one main clause with all the subordinate clauses attached to it" (Hunt, 1965, p. 20).

Vocabulary was measured by a type-token ratio, corrected for unequal language sample sizes. This ratio was calculated by dividing the number of different words by the square root of twice the total number of words (Carroll, 1964).

Four measures of syntactic complexity were calculated: the mean number of words per T-unit, the proportion of T-units less than nine words in length (a negative index), the number of nouns modified by

prepositional phrases per 100 T-units, and the number of noun clauses per 100 T-units.

In the analysis of the data, means and measures of variation were computed for the sociometric status scores and for each of the seven measures of oral language performance. These descriptive statistics were discussed with reference to the findings of Bougere (1968), Braun (1969), Ciani (1976), Fox (1972), Loban (1963), and O'Donnell, Griffin, and Norris (1967). The language measures were intercorrelated. Each of the seven measures was found to correlate with the other six. Finally, the sociometric status scores were correlated with each of the language measures. No significant relationship was found between sociometric status and the volubility, vocabulary, or syntactic complexity of oral language.

The study concluded that, within the context of its delimitations, no relationship existed between popularity and oral language performance.

A great deal more research into the popularity/oral language relationship is needed. Three particularly interesting variations of the present study involve selecting subjects from a lower socio-economic area, using subjects in grade levels higher than one and two, and employing a peer interaction/discussion procedure to obtain the oral language samples.

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Appendix A

Schedule of Instructions for the Sociometric Test Interview

1. Call the child from his classroom. Say: "Hi, (Name)! Will you come with me for a few minutes? We're going to talk about planning groups that work and play best together."
2. Chat casually with the child as you walk with him to the interview room. (Admire his clothing, mention the fish in the display case or the artwork in the halls, discuss the previous evening's TV highlights, etc.)
3. Seat the child.
4. Read the Sociometric Test Directions.
5. Ask the Sociometric Test questions and record the child's answers on the Sociometric Test Record Sheet.
6. Check that all the children chosen are in his own class.
7. Thank him and walk with him to his classroom.

When conducting the Sociometric Test interview, (1) use a relaxed and natural tone of voice, (2) avoid

the term "test" completely, (3) answer any questions raised by the student, (4) allow sufficient time for each child to answer all questions fully, (5) read the Sociometric Test directions and questions exactly as written.

Appendix B

Schedule of Instructions for the Language Interview

1. Call the child from his classroom. Say: "Hi, (Name)! We're going to see a movie and some pictures and then talk about them for a while."
2. Chat casually with the child as you walk with him to the viewing room. (Admire his clothing, comment on the current activity in the classroom, mention the fish in the display case or the artwork in the halls, discuss the previous evening's TV highlights, etc.)
3. Seat the child.
4. Say: "We are going to show you a movie. It will be something like the cartoons you have seen on TV and something like some of the films you have seen at school. There is one thing about this movie that is different from TV and films, though. There is no sound or talking in this movie. So you will have to watch very carefully to see what is happening. We want you to watch carefully because, when the show is over, we want you to tell us what happened in the story. Will you do that for us?"

5. After the children respond, say: "The name of the movie we are going to show you is 'The Ant and the Dove'. When the movie starts, watch closely and you will see the ant."

6. Show the film, with the sound turned off.

7. Say: "(Name), come with me and we'll talk about the movie and see some pictures." Walk with the child to the interview room.

8. Seat the child.

9. Turn on the tape recorder.

10. Say: "(Name), you just saw a movie about the ant and the dove. Tell me, any way you want to, what happened in the story."

11. If the child hesitates for more than fifteen seconds or says that he cannot remember the whole story, say, once only: ("You can just tell me anything you remember, any way you want to. Anything you tell me will be fine.")

12. Following the child's response and a pause of about ten seconds, say: "What else can you tell me about it?"

13. Following the child's response to this question, say: "O.K. That was fine! Thank you for telling me the story."

14. Then say: "Now, do you think that this movie shows

that when someone does something nice for you, you should do something nice for him?"

15. If the child's answer is "yes", say: "Tell me how the film shows this." If the child's answer is "no", say: "Tell me why you don't think the film shows this."

16. After the child's response, say: "O.K. Fine! Thanks, (Name)!"

17. Then say: "Now I'm going to show you some pictures."

18. After displaying each picture, say: "Tell me a story about this picture."

19. If the child hesitates for more than fifteen seconds or says that he does not know any story to tell, say, once only: ("I'm sure you can tell me a story about the picture.")

20. Following the child's response and a pause of about ten seconds, say: "What else is happening in the picture?"

21. Following the child's response and a pause of about ten seconds, say: "Tell me what you think will happen next."

22. If the child responds to this request by saying, "I don't know", say, once only: ("Tell me what you think will happen.")

23. When all the pictures have been presented, say: "My! You're a good story-teller, (Name)! Thank you very much! You may go back to your class now."
24. Turn off the tape recorder.
25. Set up the tape recorder for the next interview, making certain both the play and record buttons are down.
26. Set up the film projector for the next interview.

In conducting the language sample interview, (1) use only the prescribed statements to elicit oral language, (2) avoid offering opinions or commenting at length on the child's responses, (3) use non-prompting comments of encouragement (such as "mmm", "yes", "right", "good") as equally as possible with all children.

Appendix C

Sociometric Test Directions

During the next few weeks, you will be sitting with other children, working in small groups, and playing at the activity centers. Now that you know all the children in your room by name, you can help arrange groups that work and play best together. You can do this by telling me the names of the children you would like to have sit near you, work with you, and play with you. You may choose anyone in your class you wish to, including those who are away today. None of the other children will know whom you choose.

I will ask you to choose three children for each activity. You may choose the same person for more than one activity if you wish to. Choose carefully so the groups will be the way you really want them to be. Sometimes it is hard to give everyone his first choice but your teacher will try to arrange the groups so that each pupil gets at least one of his choices.

Appendix D

Sociometric Test Record Sheet

Name:_____ Year Level___ Date _____

1. Who would you like to have sitting near you in the classroom?

   1. _____
   2. Who else?_____
   3. And who else?_____

2. Who would you like best to work with?

   1. _____
   2. Who else?_____
   3. And who else?_____

3. Who would you like best to play with?

   1. _____
   2. Who else?_____
   3. And who else?_____

Appendix E

Language Sample Interview--Stimulus Statements

"(Name), you just saw a movie about the ant and the dove. Tell me, any way you want to, what happened in the story."

("You can just tell me anything you remember, any way you want to. Anything you tell me will be fine.")

"What else can you tell me about it?"

"O.K. That was fine! Thank you for telling me the story. Now, do you think that this movie shows that when someone does something nice for you, you should do something nice for him?"

"Tell me how the film shows this?"

or

"Tell me why you don't think the film shows this."

"O.K. Fine! Thanks, (Name)!
Now I'm going to show you some pictures."

"Tell me a story about this picture."

("I'm sure you can tell me a story about the picture.")

"What else is happening in the picture?"

"Tell me what you think will happen next."

("Tell me what you <u>think</u> will happen.")

"My! You're a good story-teller, (Name)! Thank you very much! You may go back to your class now."

Appendix F

Schedule of Instructions
for Transcribing the Language Samples

1. Oral language will be transcribed verbatim. Audible pauses ("uh", "mmm"), false starts, redundant subjects, word-tangles, noncommunicative repetitions, etc. will therefore be included.
2. A new line will be started whenever there is a change of speakers.
3. Words spoken by the interviewer will be identified by an "I" in the left-hand margin. Words spoken by the child will be identified by a "C" in the left-hand margin.
4. Double spacing will be used throughout.
5. No capitalization or punctuation will be used.
6. Each time a pause occurs in the child's speech, a slash mark will be made at that point on the transcript.
7. Each time the interviewer says, "Tell me a story about this picture", the number shown on the digital counter will be recorded in the left-hand margin.
8. Each time a segment of unintelligible speech occurs,

the number shown on the digital counter will be recorded in the left-hand margin.

9. The pages of each student's transcript will be labeled as belonging to that student and will be numbered sequentially.

Appendix G

Transcript of Raw Data

Subject	Sociometric Status	Total number of words	Total number of T-units	Type-token ratio (corrected)	Mean length of T-unit	Proportion of "short" T-units	Number of nouns modified by prep. phrases per 100 T-units	Number of noun clauses per 100 T-units
1	6	2212	257	6.705	7.65	71.98	5.06	11.28
2	5	6135	596	6.997	9.71	47.99	5.54	23.99
3	13	1038	132	5.136	7.48	71.21	3.03	8.33
4	14	1441	182	4.862	6.81	73.08	2.20	14.84
5	8	696	109	5.093	5.91	94.50	0.92	2.75
6	4	2600	296	6.379	8.22	63.85	4.73	4.05
7	6	1010	148	5.807	6.58	84.46	0	3.38
8	4	1371	197	5.997	6.07	84.26	2.03	8.12
9	10	663	85	4.806	7.19	72.94	1.18	1.18
10	7	1371	176	4.755	7.06	76.14	1.70	2.84
11	3	2241	278	5.781	7.25	75.18	1.08	2.88
12	13	2774	355	5.974	6.99	78.87	3.94	5.63
13	15	4066	542	5.090	7.05	75.38	2.58	5.90
14	8	792	126	5.352	5.93	88.29	1.59	6.35
15	5	1727	197	5.887	8.30	60.91	5.58	3.05
16	2	410	63	4.854	6.21	87.30	0	0
17	4	1432	213	5.643	6.52	82.63	4.69	8.92
18	9	1240	128	4.679	8.45	55.47	0	5.47
19	11	2024	318	5.705	5.95	86.79	2.52	2.52
20	8	6554	703	5.913	8.19	66.00	5.12	6.12
21	10	2004	254	6.634	7.45	70.47	4.33	1.18
22	19	1095	172	5.150	6.23	83.72	3.49	1.16
23	22	1335	190	4.838	6.65	82.11	1.58	0.53
24	16	2231	255	6.348	8.18	62.75	6.27	14.90
25	10	1798	216	5.753	7.70	70.83	3.24	5.56
26	9	1121	144	6.392	7.13	73.61	1.39	9.03
27	9	1490	174	4.451	7.94	70.11	1.72	4.60
28	4	1251	159	5.458	7.30	74.84	2.52	3.77
29	21	1549	185	6.008	8.09	64.32	6.49	7.03
30	13	5775	736	7.360	7.58	71.20	5.84	10.33
31	12	2595	341	5.691	6.77	80.35	1.47	2.35
32	3	2373	327	5.139	6.65	79.82	4.59	4.59
33	3	1343	179	5.576	6.88	78.77	2.23	2.23
34	1	4778	431	5.565	9.93	39.21	7.89	39.21
35	23	1048	160	5.351	6.41	88.13	1.25	0.63
36	7	1000	147	4.919	6.09	88.44	1.36	2.72

Appendix H

Explanation of the Sociometric Matrix

In reading the sociometric matrix which appears in Appendix I, it should be noted that the students are listed both down the left side of the table and across the top, and that those on the left side are designated as the ones doing the choosing.

The numbers within the cells of the matrix indicate order of preference on each of the three criteria of selection. To clarify, the digits 320 at the intersection of row 1 and column 18 indicate that Student #1 named Student #18 as his third choice for a seating companion, his second choice for a working companion, and not at all as a playmate.

The sociometric status scores of the 36 subjects were calculated by adding the total number of choices each student received.

Appendix I

Sociometric Matrix

The matrix is printed with "Students Choosing" (1–77) down the side and "Students Chosen" (1–116) across the top. Each row below gives the entries printed in that student's row, as student chosen: code.

Student Choosing	Students Chosen: code
1	18: 320; 26: 110; 49: 200; 71: 003; 86: 001; 113: 032
2	3: 211; 25: 103; 85: 332; 88: 020
3	25: 211; 48: 133; 57: 322
4	8: 122; 23: 230; 86: 011; 113: 303
5	13: 112; 53: 223; 103: 331
6	28: 220; 50: 003; 55: 032; 56: 300; 90: 111
7	10: 030; 29: 210; 72: 021; 82: 003; 97: 100; 99: 300; 115: 002
8	1: 230; 4: 020; 18: 010; 23: 101; 26: 300; 86: 003; 113: 002
9	2: 032; 43: 103; 48: 001; 57: 200; 73: 020; 85: 010; 88: 300
10	21: 122; 29: 330; 78: 001; 99: 213
11	38: 113; 78: 322; 99: 231
12	44: 111; 95: 232; 103: 323
13	5: 002; 46: 001; 53: 003; 69: 110; 92: 330; 103: 220
14	7: 201; 15: 120; 29: 003; 34: 030; 62: 300; 97: 002; 115: 010
15	14: 111; 29: 030; 72: 022; 97: 203; 115: 300
16	7: 113; 15: 230; 21: 002; 29: 001; 78: 320
17	24: 302; 30: 033; 37: 010; 45: 021; 51: 100; 60: 200
18	23: 001; 59: 300; 81: 010; 87: 132; 100: 020; 110: 203
19	28: 311; 56: 202; 70: 033; 111: 120
20	16: 020; 27: 002; 29: 010; 34: 200; 72: 030; 82: 001; 97: 100; 115: 303
21	10: 222; 78: 333; 99: 111
22	46: 222; 84: 333; 92: 111
23	4: 033; 8: 211; 18: 122; 71: 300
24	30: 002; 37: 203; 45: 001; 51: 010; 52: 300; 60: 020; 63: 100; 94: 030
25	2: 303; 9: 230; 48: 002; 73: 010; 85: 121
26	1: 110; 4: 302; 18: 203; 71: 031; 113: 020
27	10: 200; 21: 111; 29: 332; 34: 023
28	6: 002; 19: 300; 55: 200; 56: 100; 70: 001; 79: 020; 90: 010; 105: 003; 111: 030
29	7: 111; 62: 302; 72: 030; 97: 220; 115: 003
30	17: 020; 24: 200; 37: 102; 45: 030; 52: 300; 63: 013; 94: 001
31	10: 030; 11: 303; 29: 020; 38: 100; 40: 211; 47: 002
32	12: 312; 64: 001; 80: 003; 93: 220; 109: 130
33	41: 331; 44: 113; 95: 232
34	20: 032; 21: 300; 29: 100; 62: 003; 72: 020; 82: 001; 97: 010; 115: 200
35	4: 200; 18: 101; 59: 020; 66: 033; 68: 010; 87: 002; 110: 300
36	5: 030; 13: 010; 53: 303; 69: 100; 76: 200; 84: 002; 92: 020; 103: 001
37	24: 201; 30: 023; 52: 030; 63: 112; 94: 300
38	10: 112; 21: 221; 78: 303; 99: 030
39	9: 033; 24: 202; 51: 020; 54: 111; 60: 300
40	11: 020; 14: 030; 31: 302; 47: 111; 78: 203
41	32: 300; 33: 111; 64: 222; 80: 033
42	50: 003; 55: 002; 83: 030; 98: 020; 101: 200; 102: 110; 104: 001; 112: 300
43	2: 033; 9: 311; 25: 202; 48: 120
44	5: 020; 12: 030; 32: 102; 64: 003; 93: 010; 95: 201; 109: 300
45	30: 101; 37: 200; 39: 002; 51: 303; 52: 010; 54: 030; 60: 020
46	12: 021; 13: 300; 36: 200; 69: 112; 76: 030; 103: 003
47	7: 002; 16: 003; 31: 220; 58: 330; 72: 110; 78: 001
48	2: 003; 9: 002; 43: 030; 54: 001; 57: 020; 73: 200; 75: 300; 85: 110
49	1: 222; 18: 333; 100: 111
50	42: 020; 90: 030; 102: 201; 104: 302; 112: 113
51	30: 002; 45: 330; 52: 003; 60: 111; 63: 220
52	17: 030; 24: 103; 37: 300; 39: 020; 45: 200; 60: 002; 63: 001; 94: 010
53	13: 023; 69: 111; 76: 230; 92: 302
54	2: 220; 9: 032; 39: 113; 48: 300; 57: 001
55	28: 020; 56: 032; 70: 300; 79: 111; 111: 203
56	19: 111; 70: 333; 111: 322
57	2: 010; 25: 020; 43: 103; 48: 002; 74: 030; 75: 001; 85: 300; 88: 200
58	10: 201; 47: 020; 78: 333; 99: 112
59	35: 202; 65: 303; 66: 030; 68: 101; 87: 010; 110: 020
60	9: 010; 17: 303; 24: 200; 51: 101; 54: 020; 94: 032
61	4: 232; 18: 023; 26: 300; 86: 111
62	7: 203; 14: 002; 15: 001; 16: 020; 29: 110; 34: 330
63	9: 003; 24: 020; 37: 100; 45: 030; 48: 300; 51: 002; 60: 001; 73: 200; 85: 010
64	32: 010; 33: 030; 44: 101; 80: 003; 93: 002; 95: 300; 96: 020; 109: 200
65	81: 200; 87: 022; 100: 111; 110: 333
66	59: 201; 68: 122; 106: 330; 110: 013
67	77: 131; 102: 202; 104: 020; 114: 003; 116: 310
68	18: 002; 35: 103; 59: 200; 65: 001; 81: 300; 87: 030; 100: 020; 110: 010
69	5: 023; 13: 111; 76: 030; 92: 300; 103: 202
70	55: 002; 56: 230; 79: 323; 111: 111
71	68: 030; 86: 111; 89: 203; 113: 322
72	7: 303; 14: 030; 21: 010; 82: 101; 97: 020; 115: 202
73	48: 111; 85: 222; 88: 333
74	25: 010; 43: 023; 54: 302; 73: 101; 85: 200; 94: 030
75	73: 303; 85: 211; 88: 122; 94: 030
76	53: 030; 69: 103; 84: 010; 91: 301; 93: 020; 103: 202
77	67: 112

Students Choosing

Status 6 5 13 14 8 4 6 4 10 7 3 13 15 8 5 2 4 9 11 8 10 19 22 16 10 9 9 4 21 13 12 3 3 1 23 7