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A Comparative Study of the Developmental Sentence Scoring Normative Data Obtained in Canby, Oregon, and the Midwest, for Children Between the Ages of 6.0 and 6.11 Years

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AN ABSTRACT OF THE THESIS OF Stacy Ann Tilden-Browning for the Master of
Science in Speech Communication with an emphasis in Speech-Language
Pathology, presented May 1, 1985.

Title: A Comparative Study of the Developmental Sentence Scoring
         Normative Data Obtained in Canby, Oregon, and the Midwest, for
         Children Between the Ages of 6.0 and 6.11 Years.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

Mary E. Gordon, Chairperson

Robert H. English

Joseph S. Kaplan

        Lee and Canter (1971) proposed the Developmental Sentence Scoring
(DSS) system as a means by which clinicians can evaluate children's
generalizations and uses of adult grammatical structures and rules in
their spontaneous speech. In 1974, Lee provided DSS normative data for
children 2.0 to 6.11 years of age and, since that time, they have been
utilized in many research studies with little regard or consideration

for their reliability in different geographical locations.

The purpose of the present study was to investigate the effect of geographical differences on the DSS normative data for children ages 6.0 to 6.11, by comparing the original DSS normative data (Koenigsknecht, 1974) with that obtained in Canby, Oregon. A collateral purpose was to develop norms for the geographical area of Canby, Oregon, using the DSS procedure. Forty children, ten within each of the four, three-month age subgroups between 6.0 and 6.11, were chosen. All of the children came from monolingual, middle-class families and had normal hearing, normal receptive vocabulary skills, and no known unusual social, developmental, or behavioral histories. A language sample, from which a corpus of 50 utterances was selected for analysis, was elicited from each child. Each corpus was analyzed according to the DSS procedures recommended by Lee (1974).

DSS means, standard deviations, ranges of DSS scores, percentile values, mean weighted developmental scores per DSS component grammatical categories, and the mean number of utterances earning sentence points were determined for the Canby, Oregon, area. A two-tailed t-test was computed to determine if a statistically significant difference exists between the mean DSS scores for Canby, Oregon, and the Midwest.

Results of the t-test indicated the existence of a statistically significant difference between the mean DSS scores obtained in Canby, Oregon, and the Midwest, which may be attributable to the geographical differences between the two locations. Variables such as the inclusion of subjects from families whose paternal occupational scores covered the entire middle-class continuum, the receptive vocabulary skills of the

subjects, and the type of stimulus materials used, do not appear to have significantly influenced the noted differences. Other variables, e.g., differences in demographic data, may have influenced the reported differences. Differences between the particular corpuses that were selected for analyses, i.e., those consisting of utterances obtained while playing with toys or those consisting of utterances obtained while retelling a story, may have been a plausible explanation for the significant difference between the two studies. Whether these differences were influential enough to cause the statistically significant difference between the two studies remains unknown.

Since the results of the present study indicate that geographical differences may have been a plausible explanation for the statistically significant difference between the mean DSS scores obtained in Canby, Oregon, and the Midwest, speech-language pathologists need to be aware of this and use the DSS normative data with caution in geographical areas other than the Midwest.

A COMPARATIVE STUDY OF THE DEVELOPMENTAL SENTENCE SCORING

NORMATIVE DATA OBTAINED IN CANBY, OREGON, AND

THE MIDWEST, FOR CHILDREN BETWEEN THE

AGES OF 6.0 AND 6.11 YEARS

by

STACY ANN TILDEN-BROWNING

A thesis submitted in partial fulfillment of the
requirements for the degree of

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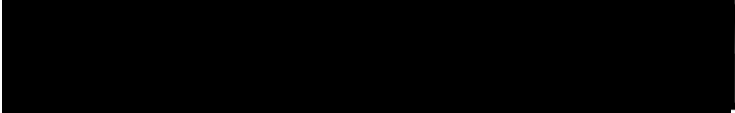TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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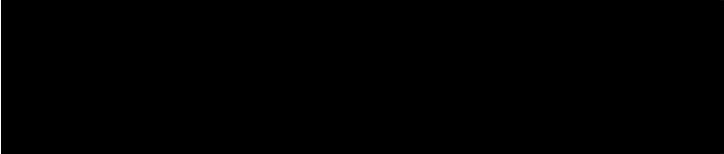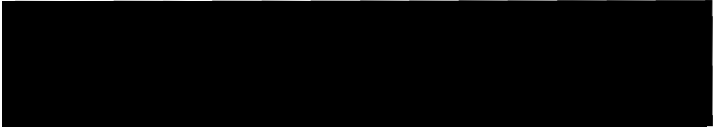Mary E. Gordon, Chairperson

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DEDICATION

This thesis is dedicated to the most important people in my life: Larry, Elma, Dick, and Glen, who have given unselfishly of themselves and who have always been there for me. They have shared my happiness during the good times and my anger, frustration, and sadness during the bad. They have had faith and confidence in me when I have had none and their constant love, patience, and support have made it possible for me to grow personally and professionally. For them, my feelings are best expressed in the words of Gary Morris (1983).

> It must have been cold there in my shadow.
> To never have sunlight on your face.
> You've been content to let me shine.
> You always walked a step behind.
>
> I was the one with all the glory.
> While you were the one with all the strength.
> Only a face without a name.
> I never once heard you complain.
>
> It might have appeared to go unnoticed.
> But I've got it all here in my heart.
> I want you to know I know the truth.
> I would be nothing without you.
>
> Did you ever know that you're my hero.
> And everything I'd like to be.
> I can fly higher than an Eagle.
> Cause you are the wind beneath my wings.

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Special thanks is extended to Mary Gordon, my advisor, thesis director, and friend, who has had the tough job of guiding and directing a highly demanding and sensitive individual. Thank you for sharing your expertise and for gently guiding me during the last three years. Dr. Robert English, you may call me "hon" any time. Your words of encouragement and praise have always come when they have been needed most and you have given me a reason for continuing more than once. Thanks! Dr. Robert Casteel, thank you for the knowledge you have unselfishly shared and for teaching me to question the work of others. Marilyn Caum, you have been a special friend, always supportive and willing to listen. You also have been my saving grace for agreeing to type my thesis. Thank you immensely for giving up so much of your personal time to do so.

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CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

Introduction

During the 1920's, the discipline of speech-language pathology
emerged as an independent, scientific field in the United States. Since
its inception, its contributors have made great strides in the advance-
ment of knowledge pertaining to the development of normal, as well as
delayed and disordered speech and language. In the years immediately
following its emergence, researchers and clinicians were primarily
concerned with disordered speech production. Communication disorders
in the areas of articulation, voice, and fluency received the focus
of attention. With the subsequent emergence of the field of psycho-
linguistics, however, the focus was broadened to include language
development and its many facets. Psycholinguists have proposed theor-
etical models of language acquisition and, for the past thirty years,
researchers and clincians have been studying children's acquisition
and use of the syntactic and semantic components of language.

In their studies concerning syntactic development, a number of
investigators have applied McNeill's (1970) distributional analysis
technique to tape-recorded samples of children's spontaneous language
(Braine, 1963; Brown and Fraser, 1963). Distributional analysis
inferred that words which occupied the same position in a combination of
words could be considered forms of a similar grammatical class for a

particular child. Rules could be written for how a child combined grammatical classes and, as his utterances increased in length and complexity, additional rules could be derived.

Although distributional analysis was a starting point in the study of syntactical development, it was soon deemed impractical due to the quick pace of a child's language development, and other methods of analysis were developed. Some investigators reported studies of a particular syntactical structure; e.g., Cazden (1968) studied noun and verb inflections; Brown (1968), wh-questions; and Bloom (1970), negatives. Others reported studies concerned with the semantic, rather than the grammatical basis of syntax (Bloom, 1970; Brown, 1973).

Although psycholinguistic studies have provided insight into the development of syntactical structures, Lee (1974) stated they have not provided normative data against which, a child's delayed or disordered language development can be compared with the normal language of children the same age. She also implied this is a major deficit, since clinicians depend on normative data for diagnosing a child's level of language development and for determining his/her progress in an intervention program.

In 1971, Lee and Canter proposed the Developmental Sentence Scoring (DSS) system as a means by which clinicians can evaluate children's generalizations and uses of adult grammatical structures and rules in their spontaneous speech. From tape-recorded samples of a
0
child's spontaneous speech, a clinician can gain insight into the child's level of linguistic mastery for indefinite pronouns, personal pronouns, main verbs, secondary verbs, negations, conjunctions,

interrogative reversals, and wh-questions.

Since its development, the DSS normative data have been utilized in numerous studies for analyzing children's grammatical complexity (Longhurst and File, 1977; Geers and Moog, 1978; Kramer, James, and Saxman, 1979; Valenciano, 1981; and Blaxley, Clinker, and Warr-Leeper, 1983). Although widely used with various populations and in a variety of geographical regions, little information is available regarding the effect of geographical differences on the DSS normative data. In 1984, McCluskey partially replicated Lee's (1974) study to investigate the effect of geographical differencs on the DSS normative data and to determine if interpretations of language performances, which occurred in different geographical regions, could be reliably based upon Lee's Midwest normative data. Substantial differences between the Portland, Oregon, and Midwest normative data for children ages 4.0 to 4.11 years were discovered. A statistically significant difference beyond the .05 level of confidence was reported between the mean DSS scores obtained in the Midwest and Portland, Oregon, and geographical differences were considered to be possible contributing factors for the reported difference. Considering the results, caution was emphasized for clinicians using the DSS normative data in geographical locations other than the Midwest. Recommendations also were made for additional replications of Lee's (1974) study to be completed in different locales across the United States, as well as in Portland, Oregon, using all of the age groups included in the original standardization.

Statement of Purpose

The purpose of this study was to investigate the effect of geographical differences on the DSS normative data for children ages 6.0 to 6.11, by comparing the original DSS normative data (Koenigsknecht, 1974) with that obtained in Canby, Oregon. A collateral purpose was to develop norms for the geographical area of Canby, using the DSS procedure.

The questions this study sought to answer were:

1. What are the descriptive statistics of the DSS on language samples obtained in Canby, Oregon, as represented by:

    a. the DSS mean and standard deviation of the overall DSS score;
    b. the range and percentiles of the average DSS sentence scores;
    c. the mean weighted developmental scores for each of the component grammatical categories; and
    d. the mean number of DSS utterances earning a sentence point for complete grammaticality?

2. Is there a significant difference between the mean DSS score obtained in Canby, Oregon, and that obtained in the Midwest by Lee (1974) and reported by Koenigsknecht (1974)?

CHAPTER II

REVIEW OF THE LITERATURE

Nice (1925) suggested that information regarding a child's level of language mastery might be obtained from his/her sentence structure. She proposed that by recording a sample of a child's conversational speech and averaging the length of a given number of his/her sentences, insight into the distinctly human process of language development might be gained. Since 1925, researchers have continued to collect and analyze children's oral language samples in an attempt to understand more thoroughly the process of language development. Today, oral language sampling remains a major component of clinical language assessments.

In consideration of the past and present use and value of oral language sampling as part of a researcher's and clinician's repertoire of diagnostic instruments, the present review of the literature provides a brief overview of the different methods for elicitation; variables which may influence elicitation, recording and transcription; and measures employed in the analysis of oral language samples. Major emphasis is directed toward Lee and Canter's (1971) Developmental Sentence Scoring (DSS) since it is the major focus of this research. Information pertaining to its standardization, studies utilizing its normative data, and the need for further research regarding its use in different geographical regions are addressed.

Methods for Elicitation of
Oral Language Samples

With the advent of psycholinguistics, the need and demand for reliable and effective evaluation measures of language development have increased. Although numerous formal language measures have been developed, they often fail to provide the clinician with information directly applicable to intervention (Fujiki and Willbrand, 1982). In contrast, informal measures such as oral language sampling often provide insight into specific strengths and weaknesses which may be incorporated in intervention.

Dale (1978) stated that currently the most effective measure of a child's use of the adult linguistic system is natural language production. At the present time, three methods for eliciting samples of a child's natural language production are being used: spontaneous, imitation, and sentence completion. During spontaneous language sampling a child speaks freely while conversing with another individual or while describing pictures, toys, and/or stories. Language sampling by imitation is accomplished by directing a child to repeat sentences varying in the degree of grammatical complexity, e.g., Carrow Elicited Language Inventory (Carrow, 1974). Sentence completion consists of a child supplying the missing word in a sentence, e.g., Bankson Language Screening Test (Bankson, 1977).

To date, none of the methods has existed without criticism. Although it is considered the most valid method, spontaneous language sampling is time-consuming, nonstandardized, and influenced by a number

of variables such as stimulus and setting. The language sampling
methods of imitation and sentence completion are advantageous in that
they are standardized, less time-consuming, and better controlled for
sampling grammatical structures ranging in complexity. Some individ-
uals, such as Lee (1974), believe imitation and sentence completion
tasks do not place a grammatical load on a child's performance as does
spontaneous, conversational speech. Research results have been incon-
clusive as both points of view have been supported in the literature.
For example, Ervin (1964) investigated the "spontaneous" imitations
and self-generated language samples of children diagnosed as having
language impairments and concluded there was no significant dif-
ference between the two. Fraser, Bellugi, and Brown (1963), however,
studied children's control of grammatical complexity in imitation, com-
prehension, and production and found their imitations to be superior to
their verbal productions. Contrary to this finding, Menyuk (1963)
reported that a child's ability to repeat grammatical structures was
dependent on his/her capability to use the grammatical rules. Dale
(1972) stated that children correctly imitate a sentence if it is within
their span of immediate memory. He concluded that if sentence imitation
tests are to be used to determine a child's use of grammatical struc-
tures, the sentences should exceed his/her short-term memory.

Whether one method of elicitation is superior to another remains
controversial. According to the implications of Fujiki and Willbrand's
(1982) study in which spontaneous language sampling was compared to
elicited imitation, sentence completion, and grammatical judgment, use
of any alternative methods of sampling without the inclusion of spontan-
eous sampling should be done so with caution.

Variables Which May Influence Elicitation, Recording, and Transcription of Oral Language Samples

The final product of elicitation has generally been considered to be a truly representative sample of a child's use of adult grammatical structures in his/her spontaneous speech. Due to the lack of standardized elicitation procedures, however, this product remains questionable. As numerous researchers have shown, variables, such as stimulus materials, listener/elicitor interaction, setting, and socioeconomic status may influence an oral language sample.

Stimulus, as defined by Barrie-Blackley, Musselwhite, and Rogister (1978), refers "to the materials and medium by which the materials are presented for the purpose of evoking verbal language behavior." From a review of the literature, it becomes apparent that a large variety of stimuli have been utilized to elicit oral language samples. They have used a number of sensory modalities including visual (pictures), visual-tactile (toys), auditory-visual (stories with pictures), and auditory (questions and conversations). Some investigators have relied on a single type of item such as pictures (Minifie, Darley, and Sherman, 1963; Cowen, Weber, Hoddinott, and Klein, 1967), while others have used a combination of items (McCarthy, 1930; Lee and Canter, 1971; Longhurst and File, 1977; Stalnecker and Creaghead, 1982).

Johnson, Darley, and Spriestersbach (1963) and Lee and Canter (1971) state that stimulus materials need to be adapted to the preference and interest of the child. Although this may be true, the effects of stimulus materials on a child's verbal output also must be considered.

Longhurst and Grubb (1974) investigated the effect of four different stimulus conditions, i.e., objects, pictures, adult-child conversation, and child-child conversation, on the length and grammatical complexity of children's language. They discovered that a child's total number of words (TNW), mean length of utterance (MLU), and length complexity index (LCI) were highest for the child-child conversational condition. In 1977, Longhurst and File studied the effect of four different stimulus conditions, i.e., single object pictures, toys, multiobject pictures, and adult-child conversation, and reported that the less structured adult-child conversational condition resulted in the highest DSS and percentile scores. James and Button (1978) utilized a child's personal toys, clinic toys, and adult-child conversation and found no significant difference among the three stimulus conditions. Utilizing child description of pictures seen by the child and experimenter, child description of pictures seen only by the child, and adult-child conversation without pictures, Haynes, Purcell, and Haynes (1979) reported the latter condition resulted in the greatest production of grammatical complexity. They proposed that when children cannot presuppose information, they tend to increase language complexity. Till and Buford (1979) investigated the effect of negative, verbal stimuli on the occurrence of negation in oral language samples and found no significant effect. Stalnecker and Creaghead (1982) studied the stimulus conditions of retelling stories with toys, playing with toys, and playing with toys while answering questions and reported the latter condition resulted in the largest number of total utterances, while retelling stories with toys resulted in the longest MLU.

If one particular stimulus material is consistently more effective than another in eliciting language samples composed of high syntactical complexity, it remains unknown. What is apparent, however, is that stimulus materials definitely do affect the final product and, therefore, should be chosen with thought.

Besides stimulus materials, investigators have examined the effect of listener/elicitor interaction on the production of complex language. Although most reported studies involve adult-child interaction, two studies have varied this feature. Shatz and Gelman (1973) investigated listener effect on the language complexity of 4 year olds and discovered that these children adjust their language complexity to different aged listeners, both in task-oriented and spontaneous speech. They reported that with 2 year old children, the 4 year olds used short simple utterances with fewer complex constructions. In 1974, Longhurst and Grubb indicated that between adult-child and child-child conversations, the latter resulted in sentences of greater complexity. Mathis (1971) approached the listener/elicitor effect by questioning if a child's verbal output would be significantly different if the listener/ elicitor was a speech-language pathologist or a mother. The results indicated that, although a mother elicited utterances with higher MLU scores, the structural complexity of the utterances elicited by a mother was similar to that of the utterances elicited by a speech-language pathologist. Olswang and Carpenter (1978) also examined the effect of mother versus speech-language pathologist and reported the quality of language elicited by both individuals was similar; however, the mothers elicited a greater quantity per time period.

In considering the effect of listener/elicitor, it becomes diffi-
cult to separate this feature from the familiarity or strangeness of the
setting. Johnson (1974) stated that the familiarity of a child's social
context influences his/her language production. Scott, Taylor, and
White (1975), Olswang and Carpenter (1978), and Kramer et al. (1979)
compared the quality of language collected in the home by mothers with
that collected in the clinic by speech-language pathologists. Scott et
al. (1975) reported that sentences with greater complexity and length
were produced in the home environment; whereas, the other two studies
showed no significant difference in the lexical, syntactical, and
semantical aspects of the language between the home and clinical envi-
ronments, but the investigators reported that mothers elicited greater
amounts of language per set time periods.

In addition to the home and clinic environments, investigators
have examined the oral language samples collected in a playroom
(Mueller, 1972), waiting room (Longhurst and Grubb, 1974), and free or
naturalistic settings (Johnson, 1974). Since the variable of setting
has not been investigated while holding all other variables constant,
definite conclusions regarding the effect of setting on the production
of complex language cannot be made.

Bernstein (1961) and Jones and McMillan (1973) chose to investi-
gate an additional variable, i.e., socioeconomic status. Their results
indicated that lower-class or economically disadvantaged children pro-
duce a restricted form of language, shorter and fewer utterances, and
less complex structures than middle-class children. As Barrie-Blackley
et al. (1978) point out, however, analysis of oral language samples

purely on the basis of socioeconomic status is difficult due to the contaminating factors of intelligence, race, physical status, and school achievement.

Additional variables that may influence an oral language sample are those associated with recording and transcription. Basically, two methods have been used for recording language samples, i.e., longhand or tape recording. According to Minifie, Darley, and Sherman (1963), recording by longhand is greatly affected by the clinician's skill at writing a child's utterances verbatim. Unlike tape recording, longhand does not result in a product that can be listened to repeatedly for verification of a child's response. Clinician's who use longhand increase the chance of missing utterances, especially longer ones, and of filling in missing words which the child did not utter. Betts (1934) reported that longhand recordings represented 32 percent of the child's utterances. Siegel (1962) demonstrated that longhand recordings increased the possibility of inaccurate and biased mean length of response analysis.

Following the recording of a language sample, one of the inherent difficulties of transcription, segmentation of the sample into appropriate utterances, becomes apparent. A number of researchers have specified guidelines for segmentation in an attempt to ease the difficulties and to produce standardized procedures. McCarthy (1930) considered separate units to be marked off from each other by pauses. Templin (1957) considered the determining factor of a sentence unit to be the natural pauses or breaks in a child's verbalizations, rather than the rules of adult sentences. Siegel (1962) defined a unit of spoken

language as any remark bound by either a pause or change in inflection. he proposed ten additional rules for determining what comprises a vocal response unit. Lee (1974) believed intonational cues should be used to determine response boundaries. She proposed a protocol for segmenting conjoined sentences.

Whether a particular combination of stimulus materials; listener/ elicitor interaction, setting, and socioeconomic status variables; recording techniques; or transcription procedures produces the most representative sample of a child's verbal linguistic abilities remains unknown. Due to the lack of standardized elicitation, recording, and transcription procedures, comparison of the results from the numerous reported studies remains difficult and unreliable.

Measures Utilized in the Analysis of Oral Language Samples

During the last half century, various measures have been devised for use in analyzing oral language samples. The type one decides to use depends largely on the information to be obtained. Mean length of response (MLR), mean length of utterance in morphemes (MLU-M), and several other procedures provide information about the length of a child's utterances. Other measures, such as the Length Complexity Index (LCI), Structural Complexity Scale (SCS), and Developmental Sentence Scoring (DSS) provide information about the syntactical or morphological complexity of a child's utterances.

Response Length

Mean Length of Response. Mean length of response (MLR) refers to

the measure whereby the number of words per response are averaged over a sample of 50 responses (Shriner, 1969). It was first proposed by Nice (1925) who stated it could possibly be the single most important factor in determining a child's mastery of adult language. McCarthy (1930) stated its objectivity, reliability, quantitativeness, and simplicity in judging linguistic mastery had not been superseded by any other measure. Minifie, Darley, and Sherman (1963) found it to be the most reliable measure among the seven language measures of mean of the five longest responses (M5LR), number of one word responses (N1W), standard deviation of response length (SD-RL), number of different words (NDW), structural complexity score (SCS), and type-token ratio (NDW/TNW). In 1969, Shriner reported its use had declined with the advent of psycholinguistics, since it provides "scant" information pertaining to the syntactical changes over time.

Mean Length of Utterance in Morphemes. Mean length of utterance in morphemes (MLU-M) is a traditional measure of language development which is defined as the average length of a child's utterance in morphemes. Shriner (1969) found it to be highly correlated with psycholinguistic scaling judgments of development. Brown (1973) stated it appeared to be the best single indicator of language development for children with a MLU under five. He stated that beyond a certain point of language development, verbal output or MLR is no longer an effective or efficient indicator of grammatical complexity. This is due to the increased growth in internal complexity of sentences with the use of embedding and other transformations, without an additional external growth in length. Although MLU-M provides more information regarding

the syntactical complexity of a child's expressive language than MLR, it has been found to have limited reliability if situational variables are not strictly controlled during the collection of a language sample (Barrie-Blackley et al., 1978).

Additional Measures of Utterance Length. Additional measures concerned with the length of a child's verbal output include: total number of words (TNW) (Longhurst and Grubb, 1974), number of one word responses (N1W), and mean of the five longest responses (M5LR) (Minifie, Darley, and Sherman, 1963), total number of utterances (Wilson, 1969), and verbs/communication unit (Musselwhite, 1975).

Structural Complexity

As Barrie-Blackley et al. (1978) stated, measures of response length provide the clinician with little information about the syntactical complexity of a child's expressive language. In addition, they provide the clinician with little information about strengths and weaknesses that can be applied to an immediate intervention plan. In essence, two sentences may be identical in length, but totally different in terms of structural complexity. In an attempt to better analyze the linguistic skills of children, a number of measures have been designed to evaluate structural complexity.

Structural Complexity Scale. The Structural Complexity Scale (SCS), developed by McCarthy (1930), measures both grammatical complexity and completeness. Utterances are divided into the categories of complete and incomplete sentences, with the complete sentences being further divided according to type of sentence and type of subordination and the incomplete sentences being classified according to the type of

omission.

Length Complexity Index. Length Complexity Index (LCI) is a modified combination of MLR and SCS, which was designed to analyze concurrently sentence length and complexity. A composite analysis of these two features is accomplished by employing a numeric weighting system and a child's final score is the total of noun phrase points, verb phrase points, and additional points divided by the number of sentences. According to Miner (1969), LCI provides more information about the morphological and syntactical aspects of a child's language than either MLR or SCS. Shriner (1969) stated that LCI is the best single indicator of language development in children 5 years of age and younger. Barlow and Miner (1969) indicated that LCI has a greater temporal reliability than MLR and, therefore, is a more stable indicator of a child's linguistic maturity.

Developmental Sentence Scoring. Lee and Canter's (1971) Developmental Sentence Scoring (DSS) was designed to provide an index of a child's generalization and use of the grammatical structures of adult Standard American English in his/her spontaneous speech. A corpus of 50 complete, different, consecutive, intelligible, nonecholalic utterances of subject-predicate form are collected and analyzed according to guidelines presented by Lee and Canter. Weighted scores, ranging from one to eight, are assigned to a developmental order of indefinite pronouns, personal pronouns, main verbs, secondary verbs, negatives, conjunctions, interrogative reversals, and wh-questions per sentence, and total sentence scores are computed. An additional sentence point is added to the sentence score of any sentence meeting all the

grammatical rules of adult Standard American English. The summation of the 50 sentence scores are averaged and a mean or DSS score is obtained This score can then be compared to the performances of normally developing children of the same chronological age.

Although much has been written about each of the measures utilized in the analysis of oral language samples, the primary focus of the present study is the DSS. Information pertaining to its background, the uses of its normative data, and the need for more research regarding the use of its normative data in different geographical locations other than the Midwest, therefore, will be discussed in depth.

Developmental Sentence Scoring

Background Information on Developmental Sentence Scoring

The DSS system was originally standardized on 160 normally developing white children, 3.0 to 6.11 years of age, residing in Illinois, Maryland, Michigan, and Kansas. They were from middle income, monolingual families in which Standard American English was spoken. Middle income status was based on the fathers' occupations, scaling three, four, and five on the seven-point Warner Scale (Warner, Meeker, and Eells, 1949). Each child obtained a mental age score between 85 and 115 on the Peabody Picture Vocabulary Test (Dunn, 1965). Eighty males and eighty females were selected, with five individuals per sex being assigned to each three-month age subgroup. Such assignment assured equal representation by sex and equal distribution of ages within a six-month age subgroup. No child with unusual developmental or social histories, suspected hearing loss, unintelligble speech, or behavioral problems was included.

In 1974, forty additional language samples were collected from normally developing children between 2.0 and 2.11 years of age. They met all the previously mentioned criteria for selection. Data from all 200 children, ages 2.0 to 6.11, were included in the establishment of normative data for the DSS system.

For both studies, the elicitation procedure was kept constant in an attempt to maintain a uniform conversational setting. The elicitation was conducted by speech-language pathologists at the Master's degree level, who were trained in the guidelines for elicitation and transcription (Lee, 1974). During the elicitation sessions, the clinicians followed Lee's guidelines, creating a conducive environment for obtaining representative samples of the children's typical spontaneous speech. Prompts and questions were employed to stimulate the children to use their most highly developed linguistic forms. Stimulus materials consisted of minature toys (a barn with farm animals, a doll family and furniture, and a transport truck with removable cars); pictures from the preprimer series, We Read Pictures, We Read More Pictures, and Before We Read (Robinson, Monroe, and Artley, 1962 a, b, c); and pictures of "The Three Bears" from What's Its Name? (Utley, 1950). The order of presentation was held constant and was as listed above. From the tape recorded samples, the clinicians transcribed the last 50 utterances for children 3.0 to 6.11 years of age and the last 100 utterances for children 2.0 to 2.11 years of age. Allowances for articulation errors, grammatical reformulations, nonfluencies, and word-finding difficulties were made. All two-hundred samples were subjected to statistical analysis and percent values were computed for the 10th,

25th, 50th, 75th, and 90th percentiles (Lee and Koenigsknecht, 1974).

Uses of the Developmental Sentence Scoring Normative Data

Since its inception, the DSS system has been utilized in a number of studies involving a wide range of populations and a variety of geographical regions.

Carrow (1974) reports using the DSS normative data in the validation of the Carrow Elicited Language Inventory (CELI), an instrument designed to measure a child's use of grammatical structures via elicited imitation of sentences. She also reports a study conducted at the University of Texas, Austin, Texas, by Cornelius (1974), in which the CELI and DSS were administered to a group of children with normal language development and to a group with diagnosed clinical language disorders. The results indicated that both measures successfully separated the two language groups. The correlation of -.79 indicated a high relationship between the two methods for evaluating grammatical development.

Longhurst and File (1977) compared the DSS scores obtained in four different stimulus conditions for twenty, 3.0 to 6.11 year old children enrolled in Head Start Programs in Manhattan, Kansas. Stimulus conditions consisted of using single object pictures, toys, multiobject pictures, and adult-child conversations. The latter stimulus condition resulted in DSS and percentile means which ranked the highest. DSS and percentile means for the stimulus conditions involving toys, multiobject pictures, and single object pictures ranked second, third, and fourth, respectively.

Using imitation and spontaneous sampling methods, Geers and Moog

(1978) collected language samples from fifty-two severely and profoundly hearing impaired students at the Central Institute for the Deaf, St. Louis, Missouri. The syntactic maturity of the hearing impaired children was compared to that of normally hearing children used by Lee (1974) and Carrow (1974) in their normative studies. Fifty-six percent of the children with hearing impairments obtained DSS scores below those of 3 year old children with normal hearing. Fifty-one percent made more errors on the CELI than the average 3 year old with normal hearing.

In Syracuse, New York, James and Button (1978) compared the MLU and DSS scores obtained in three different stimulus conditions for seven, 4.11 to 9.2 year old children diagnosed as having language disorders. Stimulus conditions consisted of using clinic toys, the children's personal toys, and adult-child conversaton without stimulus materials. No significant differences between MLU and DSS scores were determined across the three conditions. The investigators concluded that all three of the stimulus conditions will produce adequate language samples; however, the use of conversation or the children's personal toys may be more efficient than the use of clinic toys.

Kramer et al. (1979) compared the MLU and DSS scores for language samples elicited in the home by mothers and in the clinic by speech-language pathologists for ten children from Syracuse, New York. Although the MLU scores for the "home" samples were better than those for the "clinic" samples, a significant difference between the DSS scores for the "home" and "clinic" samples was not apparent. Clinically significant differences between the two sites and the MLU and DSS scores, however, were found. Seven of the ten children had higher MLU

stage placements and estimated language ages on the DSS system at home.

Interested in the pragmatic aspect of language, Haynes et al. (1979) compared the MLU and DSS scores collected in three stimulus conditions for normally developing 4 and 6 year old children from Auburn, Alabama. Stimulus conditions included using conversation; picture description with the experimenter and child viewing the picture; and picture description with both individuals in the same room, but with only the child being able to view the picture. Results indicated significant differences in DSS and MLU scores between age groups and among conditions, with the conversational setting stimulating the highest complexity of language.

In Portland, Oregon, Valenciano (1981) investigated the effect of language samples, consisting of 25, 50, and 75 utterances, on the DSS scores of 4.0 to 4.6 year old children. No statistically significant differences between the DSS scores for the different sized language samples were found when a population similar to Lee's (1974) was used.

Blaxley et al. (1983) compared DSS scores with performances on two language screening tests to determine the accuracy of these tests to identify language impairments. Forty 4.0 to 6.11 year old children from London, Ontario, were involved. The Bankson Language Screening Test (Bankson, 1977) and Fluharty Preschool Speech and Language Test (Fluharty, 1974) were administered to each child and a 50-utterance language sample was collected per child. The results indicated that the Fluharty Preschool Speech and Language Test failed to identify a large percentage of children who placed below the 10th percentile on the DSS system, while the Bankson Language Screening Test was moderately accurate in

identifying those who placed below the 10th percentile.

Need for Further Research Regarding the Use of the Developmental Sentence Scoring Normative Data in Different Geographical Regions

Although the DSS normative data have been utilized in numerous research studies, they have been used with little, if any, consideration of the effect of geographical differences. As a student engaged in the study of speech-language pathology, one encounters courses dealing with the topic of diagnosis and appraisal. One of the major points of these courses is that if a test or screening instrument is used on any population or in any manner that differs from its standardization, then the results should be evaluated with caution. As Cowen et al. (1967) stated:

> One must be aware of all possible variables and control for relevant variables so that differences in output are solely attributable to individual differences in children and not the result of contaminatory uncontrolled variables.

In Portland, Oregon, McCluskey (1984) conducted a study that addressed the effect of geographical differences on the DSS system. Replicating Lee's (1974) study, spontaneous language samples were collected from forty, normally developing 4.0 to 4.11 year old white children, from middle-class, monolingual families. Developmental sentence scores were computed for each child's language sample and descriptive statistics were applied to determine DSS means, standard deviations, ranges of DSS scores, percentile values, mean weighted developmental scores for each of the component grammatical categories, and the mean number of utterances earning sentence points for being judged completely correct grammatically and semantically. A comparison of the descriptive statistics obtained from McCluskey's study and Lee's study

was completed. The results indicated a statistically significant difference between the mean DSS score for Portland, Oregon, and that obtained by Lee in the Midwest, with the score for the Portland sample being lower than that for the Midwest sample. Geographical differences were suggested as a plausible explanation for this difference. Furthermore, additional differences between the ranges, percentile values, and mean weighted developmental scores were noted for the two geographical locations.

Considering the results of the McCluskey (1984) study and the degree to which the DSS system is used in different geographical regions, it becomes apparent that additional research needs to be completed to determine specific geographical differences for all ages included in Lee's (1974) DSS normative data.

CHAPTER III

METHODS AND PROCEDURES

Subjects

Forty, normally developing white children between the ages of 6
years and 6 years 11 months, were selected, with five females and five
males being assigned to each of the four, three-month age subgroups.
The children attended Philander Lee and Howard Eccles Elementary Schools
in Canby, Oregon. Canby, Oregon, is a rural community, whose citizens
are employed in agriculture, horticulture, business, and other profes-
sional occupations.

In addition to age and race requirements, the children met the
following selection criteria:

1. from monolingual, Standard American English speaking families;
2. from middle-class families, based on the primary breadwinner's
    occupational and educational status (U.S. Bureau of Census,
    1963);
3. normal hearing sensitivity, determined by an unilateral aud-
    iometric screening at 20dB HL for the frequencies of 500,
    1000, 2000, and 4000Hz;
4. receptive vocabulary age within one standard deviation for
    chronological age level, based on the Peabody Picture
    Vocabulary Test-Revised (PPVT-R, Dunn, 1979); and
5. no noted or suspected unusual developmental, social, or
    behavioral histories, based on teacher report and investigator
    observation.

A parental permission form, which explained the purpose of the
study and requested information about occupational and educational
status, was sent home with all first graders (Appendix A). Those stu-
dents who returned signed parental permission forms were screened for

inclusion in the study.

Instrumentation

A Bell and Howell tape-recorder, model 3179A, with an Electrovoice Professional Dynamic microphone attached, was utilized to record all language samples. A portable Maico audiometer, ANSI 1969, was employed for the audiometric screenings.

The <u>Peabody Picture Vocabulary Test-Revised</u> (PPVT-R, Dunn, 1979) was designed to measure the receptive vocabulary of individuals between the ages of 2 years, 6 months, and 40 years. It consists of two forms, L and M, each comprised of 175 stimulus pictures. The PPVT-R, Form L, was utilized to determine the children's receptive vocabulary ages as compared to their chronological ages.

The DSS (Lee, 1974) was designed to provide an index of a child' spontaneous generalization and use of the grammatical structures of adult Standard American English. From a tape-recorded, spontaneous language sample, a corpus of 50 complete, different, consecutive, intelligible, nonecholalic utterances of subject-predicate form is selected for analysis. Weighted scores, ranging from one to eight, are assigned to words within the grammatical categories: indefinite pronouns; personal pronouns; main verbs; secondary verbs; negatives; conjunctions; interrogative reversals; and wh-questions (Appendix B). A sentence point of one is added to any sentence meeting all the grammatical and semantic rules of adult Standard American English and from the summation of all sentence scores, a mean DSS score is derived by dividing the total sentence scores by the number of sentences.

By employing the scoring guidelines presented by Lee (1974), the DSS system was utilized to determine the grammatical complexity of each child's spontaneous language sample.

Screening

Returned parental permission forms were scanned and those children meeting the monolingual, middle-class status criteria were selected for further screening. Information about each child's developmental, social, and behavioral histories was obtained from teacher report and investigator observation. The PPVT-R and audiometric screenings were then administered. Forty children, who met all the screening and age criteria, were chosen for inclusion in the study.

Language Sample Collection

Language samples were elicited and tape-recorded by the investigator in quiet rooms at the schools. The children were seated at a table with the tape-recorder and microphone placed two feet away. Felt was placed under the tape-recorder and a foam rubber cushion under the microphone to decrease the amplification of unwanted ambient noise caused from handling the stimulus materials.

Stimulus materials included: a barn with farm animals, a doll family and furniture, and a transport truck with removable cars; pictures from Game Oriented Activities for Learning (Karnes, 1972); and pictures from the story, "The Three Bears" (Utley, 1950). All stimulus materials were presented to each child in the order listed.

While interacting with the children, the investigator followed Lee's (1974) guidelines for eliciting language samples (Appendix C).

Questions and prompts were used in an attempt to elicit complete sentences and structures of high grammatical complexity. The investigator also repeated the children's utterances for clarification and to assure ease in later transcription.

Language Sample Transcription

The first 10 utterances were discarded to account for warm-up and adjustmant to the conversational setting; the next 50 consecutive utterances that met all of Lee's (1974) selection criteria were transcribed (Appendix D). Transcription was completed by longhand from the tape-recorded samples and utterances were listed on a DSS record form (Appendix E). Allowances for articulation errors, grammatical reformulations, nonfluencies, and word-finding difficulties were made and Lee's guidelines for segmenting utterances were followed (Appendix F).

Scoring

Having transcribed the 50 utterances on the DSS record form, DSS reweighted scores, ranging from one to eight, were assigned to grammatical forms in the eight component grammatical categories. Grammatical forms receiving a score of one represented the earliest developing structures and those receiving an eight represented structures of high syntactical complexity. If a grammatical structure was attempted, but deemed incorrect because of its inappropriate use of an adult grammatical rule, an attempt mark was given instead of a numerical score. An attempt mark, noted by a dash, indicates grammatical structures which are emerging, but not yet fully mastered. If a sentence met all the

grammatical and semantic requirements of adult Standard American English, a sentence point of one was assigned. Sentences containing attempt marks, however, were not assigned sentence points. The summation of sentence scores was completed and a mean DSS score was derived by dividing the total of the sentence scores by the number of sentences (50).

Examiner Reliability

Scoring the grammatical complexity of the children's spontaneous language samples was completed by the investigator. The investigator was trained to use Lee's (1974) scoring guidelines, having successfully completed a course entitled, Developmental Sentence Analysis, in June, 1982. The course had been offered at Portland State University by an associate professor possessing a Certificate of Clinical Competence (CCC) in Speech-Language Pathology awarded by the American Speech-Language-Hearing Association (ASHA). The investigator also referred to Lively (1984) in order to prevent the most common scoring errors made by clinicians.

Interjudge reliability was determined between the investigator and a speech-language pathologist possessing a CCC from ASHA. A randomly-chosen language sample consisting of 50 utterances was presented to each judge for independent DSS analysis. Interjudge reliability was 90 percent. Decisions pertaining to the analysis of various utterances were made during a calibration session between the two judges and future analyses were completed on the bases of these decisions.

One week later, intrajudge reliability was determined by the

investigator's DSS analysis of 25, randomly selected utterances from the original 50-utterance sample utilized in the interjudge comparison. The derived intrajudge reliability was 92 percent.

Analysis of Data

DSS scores were computed for each child's spontaneous language sample. Descriptive statistics were then applied to determine mean DSS scores, percentile values, mean weighted developmental scores for each component grammatical category, and the mean number of DSS utterances earning sentence points for being completely correct grammatically and semantically. The descriptive statistics obtained in Canby, Oregon, were then compared to those obtained in the Midwest by Lee (1974) and reported by Koenigsknecht (1974). To determine if a statistically significant difference existed between the overall mean DSS score for the Canby, Oregon, sample and that for the Midwest sample, a two-tailed t-test for independent means was computed according to the procedures for determining the difference between a sample mean and population mean as described by Bruning and Kintz (1977).

CHAPTER IV

RESULTS AND DISCUSSION

Results

Individual language samples were elicited from forty children between the ages of 6 years and 6 years, 11 months, who met all of Lee's (1974) criteria for subject selection. The language samples were then analyzed according to the DSS procedures described by Lee and DSS descriptive statistics were determined for the geographical area of Canby, Oregon. To determine if geographical differences influenced the DSS scores for children aged 6.0 to 6.11, the descriptive statistics for Canby, Oregon, were then compared with the original DSS normative data obtained in the Midwest. The resultant data provided the following answers to each of the proposed research questions.

The first research question was: What are the descriptive statistics of the DSS on language samples obtained in Canby, Oregon? Table I shows the mean and standard deviation for each of the four, three-month age subgroups, as well as for the total group. The means ranged from 7.88 to 10.23 with a total group mean of 9.08 and standard deviation of 1.90.

Ranges and percentiles of the DSS scores for the total group and for each of the three-month age subgroups are represented in Table II. The total group range was 5.90 to 13.52 with the 10th, 25th, 50th, 75th, and 90th percentile values being 6.52, 7.84, 8.66, 9.98, and 12.02,

respectively.

TABLE I

DSS MEANS AND STANDARD DEVIATIONS FOR
FORTY SUBJECTS BY THREE-MONTH AGE
GROUPS (CANBY, OREGON)

Age Groups	N	Mean DSS	S.D.
6.0-6.2	10	8.95	1.22
6.3-6.5	10	10.23	1.87
6.6-6.8	10	9.28	2.25
6.9-6.11	10	7.88	1.56
6.0-6.11	40	9.08	1.90

TABLE II

RANGE AND PERCENTILES OF DSS SCORES FOR FORTY
SUBJECTS BY THREE-MONTH AGE GROUPS

Age Group	N	Range	Percentiles				
			10th	25th	50th	75th	90th
6.0-6.2	10	7.80-12.02	7.80	8.26	8.60	8.92	9.98
6.3-6.5	10	7.80-13.52	7.80	9.52	9.60	11.58	12.92
6.6-6.8	10	6.52-13.28	6.52	7.80	7.84	10.60	12.52
6.9-6.11	10	5.90-10.22	5.90	6.34	8.10	9.20	9.88
6.0-6.11	40	5.90-13.52	6.52	7.84	8.66	9.98	12.02

TABLE III

MEAN WEIGHTED DEVELOPMENTAL SCORES FOR THE DSS COMPONENT
GRAMMATICAL CATEGORIES AND MEAN NUMBER OF SENTENCE
POINTS FOR FORTY SUBJECTS

Age Group	Indefinite Pronouns	Personal Pronouns	Main Verbs	Secondary Verbs	Neg.	Conj.	Interr. Revers.	Wh- Ques.	Sentence Points
6.0-6.2	58.90	88.00	126.00	40.70	15.70	51.90	16.60	11.20	38.60
6.3-6.5	75.60	105.20	116.20	39.50	26.90	81.70	21.50	9.80	35.70
6.6-6.8	56.70	97.30	119.40	37.40	26.60	65.40	12.00	9.50	39.90
6.9-6.11	54.90	85.70	100.10	32.60	29.10	45.80	4.60	2.40	39.10
6.0-6.11	61.53	94.05	115.43	37.55	24.58	61.20	13.68	8.23	38.33

TABLE IV

COMBINED MEAN DEVELOPMENTAL SCORES PER COMPONENT GRAMMATICAL
CATEGORY BASED ON 50-UTTERANCE SAMPLES FOR FORTY SUBJECTS

Age Group	Indefinite Pronouns	Personal Pronouns	Main Verbs	Secondary Verbs	Neg.	Conj.	Interr. Revers.	Wh- Ques.
6.0-6.11	2.06	1.95	1.89	3.75	4.23	4.67	2.74	2.20

The mean weighted developmental scores for each of the eight DSS component grammatical categories are displayed in Table III. The total group mean weighted developmental score for each of the component grammatical categories was: indefinite pronouns, 61.53; personal pronouns, 94.05; main verbs, 115.43; secondary verbs, 37.55; negatives, 24.58; conjunctions, 61.20; interrogative reversals, 13.68; and wh-questions, 8.23. Also shown in Table III is the mean number of sentence points awarded to the total group for utterances judged to be completely correct grammatically and semantically. The mean number of sentence points for the total group was 38.33.

Table IV shows the combined mean developmental score for each of the eight DSS component grammatical categories, based on 50-utterance samples for forty children. The combined mean developmental score for each of the component grammatical categories was; indefinite pronouns, 2.06; personal pronouns, 1.95; main verbs, 1.89; secondary verbs, 3.75; negatives, 4.23; conjunctions, 4.67; interrogative reversals, 2.74; and wh-questions, 2.20.

Reference to the descriptive statistics presented in Tables I through IV provides the answer to the first research question. The second research question will now be addressed.

The second research question was: Is there a significant difference between the mean DSS score obtained in Canby, Oregon, and that obtained in the Midwest by Lee (1974) and reported by Koenigsknecht (1974)? To determine whether or not a significant difference exists between the mean DSS scores obtained in Canby, Oregon, and the Midwest, a two-tailed t-test was computed according to procedures presented by Bruning and Kintz (1977). By referring to Table V, one may note that a

statistically significant difference beyond the .05 level of confidence occurred between the two different geographical means with the Midwest group obtaining a higher mean DSS score. The DSS mean for the Midwest sample was 10.94, while that for Canby, Oregon, was 9.08.

TABLE V

A COMPARISON OF THE DSS MEANS AND STANDARD
DEVIATIONS OBTAINED IN THE MIDWEST
AND CANBY, OREGON

Geographical Location	Mean	S.D.	df	$\underline{t}$ test	p
Midwest (1974)	10.94	2.26	39	2.042	<.05
Canby (1985)	9.08	1.90			

Further comparisons of the results obtained in the two geographical locations indicated additional differences. For instance, in reviewing the ranges for the two samples, one may note that the Canby, Oregon, range was more restricted, with each of its extremes being lower than those for the Midwest range (Table VI). In addition, the values for the 10th, 25th, 50th, 75th, and 90th percentiles were lower for Canby, Oregon.

Lee (1974) suggested that one could evaluate a child's performance by comparing his/her DSS score with that of normally developing children of the same age. This is done by plotting the individual child's DSS score on the "Norms for Developmental Sentence Scoring" graph

TABLE VI

A COMPARISON OF THE RANGES AND PERCENTILES OF DSS
SCORES FOR THE MIDWEST AND CANBY, OREGON,
FOR CHILDREN 6.0 THROUGH 6.11 YEARS

| Geographical | N | Range | Percentiles | | | | |
			10th	25th	50th	75th	90th
Midwest	40	6.64-15.84	8.11	9.43	10.94	12.43	13.78
Canby	40	5.90-13.52	6.52	7.84	8.66	9.98	12.02

(Appendix G) in order to determine his/her percentile level. By fol-

lowing this procedure, each of the individual DSS scores for Canby,

Oregon, was assigned to a percentile level according to the Midwest

norms, as well as to a percentile level based upon the normative data

for the Canby sample. As shown in Table VII, thirty-five of the indi-

vidual DSS scores for the Canby sample were assigned to lower percentile

levels when the Midwest norms were used instead of the Canby norms.

This phenomenon occurred for each of the four, 3 month age subgroups, as

well as for the total group.

In each of the DSS component grammatical categories, the mean

weighted developmental scores for the Midwest and Canby, Oregon, samples

were compared (Tables VIII and IX). Since Koenigsknect (1974) did not

provide standard deviations for each of the grammatical categories, it

was impossible to determine if statistically significant differences

existed between the mean weighted developmental scores for each

TABLE VII

A COMPARISON OF THE NUMBER OF SUBJECTS PER
PERCENTILE LEVEL USING MIDWEST NORMS
AND CANBY, OREGON, NORMS

| Geographical Location | Range | N of S_s | Percentiles | | | | | |
			Below 10th	10th	25th	50th	75th	90th
Midwest (1974)	6.0-6.2	10	0	7	2	0	1	0
Canby (1985)			0	1	4	3	1	1
Midwest	6.3-6.5	10	1	1	5	1	1	1
Canby			0	1	1	4	2	2
Midwest	6.6-6.8	10	5	1	2	0	2	0
Canby			0	3	2	1	2	2
Midwest	6.9-6.11	10	7	1	2	0	0	0
Canby			3	1	3	2	1	0
Combined								
Midwest	6.0-6.11	40	13	10	11	1	4	1
Canby			3	6	10	10	6	5

category. An examination of the data presented in Table VIII, however,
indicates that the children in Canby, Oregon, used a higher number of
and/or more complex grammatical forms in the grammatical categories of
secondary verbs, negatives, interrogative reversals, and wh-questions,

TABLE VIII

**A COMPARISON OF THE MEAN WEIGHTED DEVELOPMENTAL SCORES
ON THE DSS COMPONENT GRAMMATICAL CATEGORIES AND THE
MEAN NUMBER OF SENTENCE POINTS FOR FORTY SUBJECTS
BY GEOGRAPHICAL LOCATION**

Grammatical Category	Mean		Difference
	Midwest (1974)	Canby (1985)	
Indefinite Pronouns	76.20	61.53	-14.67
Personal Pronouns	109.50	94.05	-15.45
Main Verbs	162.50	115.43	-47.52
Secondary Verbs	36.48	37.55	+ 1.07
Negatives	15.83	24.58	+ 8.75
Conjunctions	100.95	61.20	-39.75
Interrogative Reversals	1.98	13.68	+11.70
Wh-Questions	2.05	8.23	+ 6.18
Sentence Points	41.38	38.33	- 3.05

while the children in the Midwest used a higher number of and/or more more complex grammatical forms in the categories of indefinite pronouns, personal pronouns, main verbs, and conjunctions. They also received a higher mean for sentence points, indicating they used more sentences that were judged to be completely correct grammatically and semantically.

Table IX shows the complexity of the grammatical forms per

TABLE IX

A COMPARISON OF THE MEAN DEVELOPMENTAL SCORES
PER DSS COMPONENT GRAMMATICAL CATEGORY
BY GEOGRAPHICAL LOCATION

Grammatical Category	Mean	
	Midwest (1974)	Canby, Oregon (1985)
Indefinite Pronouns	2.20	2.06
Personal Pronouns	2.09	1.95
Main Verbs	2.10	1.89
Secondary Verbs	3.27	3.75
Negatives	5.22	4.23
Conjunctions	3.72	4.67
Interrogative Reversals	1.28	2.74
Wh-Questions	1.16	2.20

component grammatical category that was used by the children in both geographical locations. A review of the data indicates that the Canby, Oregon, subjects used more complex grammatical forms in the grammatical categories of secondary verbs, conjunctions, interrogative reversals, and wh-questions; whereas, the Midwest subjects used more complex grammatical forms in the categories of indefinite pronouns, personal pronouns, main verbs, and negatives.

Reference to the descriptive statistics in Table V provides the

answer to the second research quesiton. A statistically significant difference exists between the mean DSS scores for the two different geographical locations of Canby, Oregon, and the Midwest. Furthermore, Tables VI through IX show additional differences between the ranges, percentile values, and mean weighted developmental scores per grammatical category for the two geographical locales. Considering these findings, some of the variables which may have affected the outcome of the present study will now be discussed.

Discussion

From a review of the literature pertaining to oral language sampling, it became apparent that numerous variables probably influence oral language samples elicited from children. Bernstein (1961) and Jones and McMillan (1973) reported that the language of children from different socioeconomic class families produce language consisting of shorter and fewer units and fewer complex grammatical structures.

In consideration of this point, the forty children included in the present study met the same socioeconomic criterion used by Lee (1974). As Lee stated, Warner, Meeker, and Eells (1949) reported that occupational ratings are the single most powerful status characteristic for determining social-class. In 1974, Lee used the seven-point Warner scale for rating the paternal occupations of her subjects and for determining middle-class status. With the exception of three subjects, all of her subjects came from middle-class families as determined by the paternal occupational ratings of three, four, and five on the seven-point scale. In the present study, middle-class status was based on paternal occupational and educational levels as determined by the U.S.

Bureau of Census scores for occupational and educational levels (1963).
The paternal occupational scores covered the entire middle-class con-
tinuum, with a range of 28 to 90 and a mean of 67.80. The educational
mean was 80.35.

Considering, that the paternal occupations covered the entire
middle-class continuum, and, that Bernstein (1961) and Jones and
McMillan (1973) found that different socioeconomic levels affect the
language of children, it could be contended that the depressed overall
mean DSS score of the present study may be due to the inclusion of chil-
dren from lower, middle-class families. To determine if this was true,
the individual DSS scores for the children from lower, middle-class
families were compared with those of the children from upper, middle-
class families. This was accomplished by dividing the forty individual
DSS scores into two groups, i.e., those falling above the mean occupa-
tional score of 67.80 and those falling below, and by subjecting the
two groups of scores to a two-tailed t-test for independent means.
The range for the DSS scores falling above the mean occupational score
was 6.34 to 13.52, while the range for those falling below was 5.90 to
12.92. The means were 9.42 and 8.54, respectively. The results of the
t-test indicate that a statistically significant difference did not
exist between the DSS scores for the children from lower and upper,
middle-class families (Table X). The depressed overall mean DSS score
for the Canby, Oregon, sample does not, therefore, appear to be attri-
butable to the inclusion of children from lower, middle-class families.
One must consider, however, that Lee (1974) and the present investigator
utilized two different occupational scales in determining socioeconomic
status and, therefore, the definition for middle-class may have varied

between the two studies.

TABLE X

A COMPARISON OF THE DSS SCORES AND STANDARD DEVIATIONS
FOR THE CHILDREN FROM LOWER AND UPPER, MIDDLE-
CLASS FAMILIES IN THE CANBY, OREGON, SAMPLE

Socioeconomic Level	Mean	S.D.	df	$\underline{t}$ test	p
Lower, Middle-Class	8.54	2.02			
			38	2.042	>.05
Upper, Middle Class	9.42	1.78			

The variable of extreme discrepancies between the receptive vocabulary skills of the forty participants in this study does not appear to be accountable for the depressed overall mean DSS score. One of Lee's (1974) criteria for subject selection was that a child's score on the Peabody Picture Vocabulary Test fall within one standard deviation for the mean score for his/her age level. Using the same criterion, all of the children's PPVT-R scores for the present study fell within the range of 85 to 115.

The effect of different stimulus materials on the complexity of language elicited from children has been investigated by numerous individuals and discussed in Chapter II. To control for this variable, stimulus materials similar to those used by Lee (1974) were used in the

present study. Lee used a small barn and farm animals, a doll family
and furniture, a transport truck with cars; story action pictures from
the preprimer series, We Read Pictures, We Read More Pictures, and
Before We Read (Robinson et al., 1962 a, b, c); and pictures of "The
Three Bears" from What's Its Name (Utley, 1950). With the exception of
pictures from the Game Oriented Activities for Learning (Karnes, 1972),
which were substituted for the preprimer pictures used by Lee, this
study used the same stimulus materials. Although pictures from a dif-
ferent source were used, it is not likely that the substitution was a
major influence on the individual DSS scores obtained, since 36 of the
40 corpuses consisted totally of utterances obtained during play with
the toys.

Although each of the stimulus materials was presented to each
child in the present study, as previously stated, the majority of the
analyzed corpuses were selected from utterances obtained during play
with the toys. This may be one explanation for the difference between
the overall mean DSS scores of the two geographical locations.

According to Lee (1974), utterances that are chosen for inclusion
in a corpus must be consecutive and should represent a child's "best"
performance. The first utterances should be omitted in order to control
for any possible periods of warm-up and adjustment to the conversational
setting by the child and utterances should be counted when the child has
become talkative and spontaneous.

In Lee's (1974) study, she selected the last 50 utterances per
language sample for two reasons. First, she wanted to control for pos-
sible periods of warm-up and adjustment by the child. Secondly, she

wanted to assure that the corpus would contain all of the utterances
elicited while the child retold the story of "The Three Bears." She
hypothesized that a child would produce higher levels of speech while
retelling the story than while playing with the toys or looking at the
pictures. As she stated, it is impossible for a child to speak "bet-
ter" than his/her grammatical rules will allow, but it is possible for
him/her to speak more simply and immaturely than he/she is capable of
doing. By selecting the corpus from utterances obtained during the
retelling of the story, Lee, was in essence, attempting to assure that a
child's performance reflected his/her grammatical competence.

When the "story" utterances from the present study were visually
scanned, it became apparent that although they may have consisted of
higher level grammatical forms, they were also similar to rote
responses. They did not appear to represent spontaneously produced
utterances. Too many of the "story" utterances within a corpus and
across the 40 corpuses were identical in form. It was as if the chil-
dren were merely echoing or repeating sentences which they had heard at
an earlier time. Many of their utterances were spoken as if they
were saying the ABC's or counting to ten. They were spoken with
increased speed and with little time or thought being given to their
development. According to Longhurst (1975), utterances that are pro-
duced by a child while retelling a story are not a representative
sample of his/her language competence, but instead are a reflection of
his/her ability to memorize or remember specific responses. If this is
true, possibly children do speak "better" than their grammatical rules
will allow while retelling a story, because they are producing rote

utterances rather than developing spontaneous utterances that are
dependent upon their present level of grammatical development.

In the present study, the first 10 utterances were omitted to allow
for warm-up and adjustment by the child and the next 50, consecutive
utterances that met all of Lee's (1974) criteria for corpus selection
were used (Appendix D). Possibly, if the last 50 utterances per lan-
guage sample had been chosen, the mean DSS score for the Canby, Oregon,
sample would not have been significantly different from that of the
Midwest sample. On the other hand, would it have been a true represen-
tation of the spontaneous use of grammatical forms by Canby, Oregon,
children? Whether the significant difference between the overall mean
DSS scores for the two geographical locations may be attributable to
the differences in the selection of utterances for the corpuses, remains
unknown. It would be interesting to see the results of a study that
compared the DSS scores for language samples elicited with the same toys
used by Lee, with those for language samples elicited with either the
pictures or story used by Lee.

All of the language samples were elicited in the same environment
and according to Lee's (1974) criteria for elicitation (Appendix C).
The environment consisted of quiet school rooms in which only the child
and clinician were present. The clinician used high level grammatical
forms in an attempt to elicit such forms from the child. Although she
did use questions and prompts, she primarily employed the indirect lan-
guage stimulation techniques of parallel talk and self talk in order to
elicit spontaneous, rather than specific language. Parallel talk
refers to the technique in which the clinician talks about what the

child is seeing, feeling, and/or doing. Self talk refers to the technique in which the clinician talks about what s/he is seeing, feeling, and/or doing (Rosenthal and Weybright, 1979, 1980, 1983). Neither technique requires or demands a response from the child, but instead, offers the child freedom to respond as s/he desires. Although Lee does not refer to these techniques as parallel talk or self talk, she suggests the use of similar techniques.

In the transcription and scoring of the elicited language samples, care was taken to follow the procedures and guidelines recommended by Lee (1974, Appendix F). In addition, continuous efforts were made to prevent the occurrence of the most common scoring errors which were discussed by Lively (1984). Although the rules for segmenting a language sample were followed as closely as possible, it is possible, although unlikely, that the lower mean DSS score for the grammatical category of conjunctions was due to the clinician's segmentation of the language samples.

Other variables which were not directly controlled for in the present study, but which may have influenced the reported difference between the overall mean DSS scores for Canby, Oregon, and the Midwest include: cultural differences; differences in parenting skills, parental education levels, parental values and morals, the number of children who attended preschool and/or kindergarten, and the type and quality of the educational services provided in the two different geographical regions, etcetera.

In addition to the difference between the overall mean DSS scores for the two geographical locations, other discrepancies were noted.

According to Lee (1974), the mean DSS scores for the five, one year age groups, between 2 years and 6 years 11 months, displayed a quantifiable and progressive increase in grammatical complexity. Although only the age group of 6.0 to 6.11 was investigated in this study, it was noted that a quantifiable and linear increase in grammatical complexity did not occur among the four, three-month age subgroups (Table I). The mean DSS scores for the four, three-month age subgroups were: 8.95, with a standard deviation of 1.22 for the age group of 6.0 to 6.2; 10.23, with a standard deviation of 1.87 for the age group of 6.3 to 6.5; 9.28, with a standard deviation of 2.25 for the age group of 6.6 to 6.8; and 7.88, with a standard deviation of 1.56 for the age group of 6.9 to 6.11. The mean DSS score peaked at the 6.3 to 6.5 age subgroup and successively decreased to its lowest level at the 6.9 to 6.11 age subgroup.

The lower mean DSS score for the 6.9 to 6.11 age subgroup may have been due to a larger number of incorrect uses of the later-developing grammatical structures than that for the younger subgroups; which, in turn, resulted in a reduced sentence point total. Although a plausible explanation, it is not supported by the data. Instead, the 6.9 to 6.11 age subgroup used the lowest number of later developing grammatical forms in the categories of personal pronouns, main verbs, secondary verbs, conjunctions, interrogative reversals, and wh-questions, and obtained the second highest sentence point total. This group also received the lowest mean weighted developmental score for the grammatical categories of indefinite pronouns, personal pronouns, main verbs, secondary verbs, conjunctions, interrogative reversals, and

wh-questions.

This raises another point of difference between Lee's (1974) study and the present study. In the present study, the mean weighted developmental scores for the DSS component grammatical categories did not show a quantifiable and progressive developmental sequence. For the categories of indefinite pronouns, personal pronouns, conjunctions, and interrogative reversals, the mean weighted developmental score peaked at the 6.3 to 6.5 age subgroup. In the categories of main verbs, secondary verbs, and wh-questions, they were the highest at the 6.0 to 6.2 age subgroup. For the category of negatives, the mean weighted developmental scores rose at the 6.6 to 6.8 age level, and then peaked at the 6.9 to 6.11 age level.

A comparison of the mean developmental scores for the DSS component grammatical categories of Lee's (1974) study and the present study indicated further differences. According to the data, the children from Canby, Oregon, produced more complex grammatical forms in the grammatical categories of secondary verbs, conjunctions, interrogative reversals, and wh-questions, while the children from the Midwest produced more complex grammatical forms in the categories of indefinite pronouns, personal pronouns, main verbs, and negatives. They also received a higher mean for total sentence points.

Although the mean developmental scores for the DSS component grammatical categories differed between the Canby, Oregon, and Midwest samples, it is interesting to note the similarities between the results obtained in a similar study conducted by McCluskey (1984), in Portland, Oregon, with children aged 4.0 to 4.11, and those obtained in the present study. McCluskey found that 4 year old children in Portland,

Oregon, produced more complex grammatical forms in the grammatical categories of secondary verbs, negatives, conjunctions, interrogative reversals, and wh-questions, while 4 year olds in the Midwest produced more complex grammatical forms in the categories of indefinite pronouns, personal pronouns, and main verbs. The children in Portland also received a higher mean for sentence points than those in the Midwest. With the exception of the categories of negatives and sentence points, the results reported by McCluskey are similar to those found by the present study.

In reviewing the results of McCluskey's (1984) study and the present study, it would appear that the geographical differences between the Midwest and the Oregon locations do influence the DSS scores for children aged 4.0 to 4.11 and 6.0 to 6.11. Caution needs to be taken, however, in making such a conclusion. In reviewing the variables in both studies, certain factors warrant suspicion. For instance, both McCluskey and the present clinician attended the same graduate school, were trained in the same philosophical environment, and completed the same course on DSS scoring offered by the same professor. It seems plausible, therefore, that these factors may have had an influence on their clinical techniques, including their abilities in eliciting, transcribing, and scoring language samples. Considering this, it is not possible to conclude that the differences between the Oregon studies and the Midwest study are definitely due to geographical differences in how children learn language. The differences between the Oregon studies and the Midwest study may be due to the different clinical techniques employed by the clinicians in the Midwest and those in Oregon or to

differences in the particular corpuses selected for analysis. On the other hand, since all of the clinicians who were involved reportedly followed Lee's (1974) guidelines and procedures, and, since, the variable of geographical location was the only systematically manipulated variable in the replications of Lee's study, geographical differences may have accounted for the differences in the data. If this is true, it would be imperative for clinicians practicing in geographical locations other than the Midwest to use the original Midwest DSS normative data with caution, or to develop DSS normative data for their geographical locale.

CHAPTER V

SUMMARY AND IMPLICATIONS

Summary

Since 1925, researchers and clinicians have been collecting and
analyzing the oral language samples of children in an effort to better
understand the process of language development. During this time, a
number of methods have been employed in the process of analysis. Some
have focused on response length, while others have concentrated on
structural complexity.

While much has been written on all of these methods, the DSS was
the focus of the present study. From reviewing the literature
pertaining to the DSS, it became apparent that although the DSS norma-
tive data had been used in many research studies, little regard or con-
sideration had been given to their reliability in different geograph-
ical locations. In 1984, McCluskey replicated Lee's (1974) study in
Portland, Oregon, in an attempt to investigate the possible influence of
geographical differences on the DSS scores for children, aged 4.0 to
4.11. The results indicated significant differences between the Port-
land, Oregon, DSS normative data and those obtained in the Midwest by
Lee and reported by Koenigsknecht (1974).

Considering this, the present study sought to continue the inves-
tigation into the effect of geographical differences on the DSS scores
for children residing in different geographical locales. Its purpose

was to replicate Lee's (1974) study with children, aged 6.0 to 6.11, in order to determine if significant differences similar to those reported by McCluskey also were true for another age group included in Lee's normative population. A collateral purpose was to continue collecting normative data for Oregon, specifically, Canby, Oregon. Forty children, ten within each of the four, three-month age subgroups between 6.0 and 6.11 were chosen. All of the children came from monolingual, middle-class families and had normal hearing, normal receptive vocabulary skills, and no known unusual social, developmental, or behavioral histories. A language sample, from which a corpus of 50 utterances was selected for analysis, was elicited from each child. Each corpus was analyzed acccording to the DSS procedures recommended by Lee.

From the information obtained from the analysis of the forty language samples, DSS means, standard deviations, ranges of DSS scores, percentile values, mean weighted developmental scores per DSS component grammatical category, and the mean number of utterances earning sentence points were determined for the Canby, Oregon, area. A two-tailed t-test was computed to determine if a statistically significant difference exists between the mean DSS score for Canby, Oregon, and the Midwest.

Results of the t-test indicated the existence of a statistically significant difference between the mean DSS scores obtained in Canby, Oregon, and the Midwest, which may be attributable to the geographical differences between the two locations. Variables such as the inclusion of subjects from families whose paternal occupational scores covered the entire middle-class continuum, the receptive vocabulary skills of the subjects, and the type of stimulus materials used, do not appear to have

significantly influenced the noted differences. Other variables, e.g.,
differences in demographic data, may have influenced the reported dif-
ferences. Differences between the particular corpuses that were sel-
ected for analysis, i.e., those consisting of utterances obtained while
playing with toys or those consisting of utterances obtained while
retelling a story, may have been a plausible explanation for the signif-
icant differences between the two studies. Whether these differences
were influential enough to cause the statistically significant differ-
ence between the two studies remains unknown.

When the results of McCluskey's (1984) Portland, Oregon, study and
the present study were compared with those of Lee's (1974) Midwest
study, it appeared that the geographical differences may have, in fact,
been responsible for the differences between the mean DSS scores of
children living in Oregon and the Midwest. Caution must be emphasized,
however, due to the possible contamination of these results by the
clinical techniques used by the clinicians in the different geographical
locations. Although all of the clinicians who were involved followed
Lee's guidelines and procedures for eliciting, transcribing, and scor-
ing language samples, differences in clinical techniques may have been
responsible for the significant differences between the results
obtained in the Oregon and Midwest locations. On the other hand, since
the two clinicians in Oregon replicated Lee's study as closely as pos-
sible, and since the variable of geographical location was the only
systematically manipulated variable, it is feasible that geographical
differences may have been attributable for the differences between the
Oregon norms and those of the Midwest.

Implications

Clinical Implications

Since the results of the present study, as well as those of McCluskey's (1984) study, indicate that geographical differences may be a plausible explanation for the statistically significant differences between the mean DSS scores obtained in Oregon, and the Midwest, speech-language pathologists need to be aware of this and use the DSS normative data with caution in geographical areas other than the Midwest.

As shown by the results of both of the Oregon studies, children in Canby, aged 6.0 to 6.11, and children in Portland, aged 4.0 to 4.11, would be assigned to lower percentile levels if the Midwest normative data were used instead of the Oregon normative data. According to Lee (1974), children whose mean DSS scores fall close to the 10th percentile line on her "Norms for Developing Sentence Scoring" graph need to be evaluated further. Those whose scores fall as much as one DSS point below the 10th percentile line most likely will warrant intervention. In these days of large case loads and the reality of having to make choices as to who will receive speech-language services, one does not need to be spending time considering children who really do not warrant services. Referring only to the assigned percentile values from the Canby, Oregon, study, one can see that if the Midwest norms were used to determine expressive language ability, one child would be assigned to the 90th percentile; four to the 75th; one to the 50th; eleven to the

25th; ten to the 10th; and ten below the 10th percentile. In contrast, if the Canby, Oregon, norms were used, five children would be assigned to the 90th percentile; six to the 75th; ten to the 50th; ten to the 25th; six to the 10th; and three below the 10th percentile. In other words, a child in Oregon could be classified as language delayed if the Midwest norms were used, and within the 10th or 25th percentile if the Canby, Oregon, norms were used.

According to Lee (1974), the DSS system is too complicated to be used as an initial diagnostic tool. Instead, she recommends that it be used as a means of assessing a child's need for further services.

Use of the DSS normative data in this manner outside of the Midwest, however, still warrants caution due to the possible affect of geographical differences on the obtained DSS scores. Speech-language pathologists need to be aware that more research is essential before the DSS normative data may be used in different geographical locales without geographical differences playing a significant role in the DSS scores that are obtained.

Research Implications

Additional replications of Lee's (1974) study in different geographical locales around the United States would assist in clarifying whether or not geographical differences affect DSS scores, and, if so, to what degree? If it is found that geographical differences do not affect DSS scores obtained in different geographical locations, then are other variables found to do so significantly? For example, it would be interesting to investigate if differences between the particular corpuses that are selected for analyses, i.e., those consisting of

utterances obtained while playing with toys or those consisting of utterances obtained while retelling a story, significantly affect the DSS scores for children. Are the DSS scores that are based upon the retelling of a story by children significantly different than those based upon utterances obtained during play with toys?

Continued research in the geographical area surrounding the Portland, Oregon, locale, with the other age groups included in Lee's (1974) normative study, would add additional impact to the results of this study, as well as those reported by McCluskey (1984). Does a statistically significant difference exist between the mean DSS scores for children, age 2.0 to 2.11, 3.0 to 3.11, and 5.0 to 5.11, from Portland, Oregon, and those for children of the same ages from the Midwest? Another benefit of such research would be the additional development of DSS normative data for the Portland, Oregon, area.

It also would be interesting if someone in a more urban portion of the surrounding Portland area would replicate Lee's (1974) study using children aged 6.0 to 6.11. The results of such a study could then be compared to those obtained in the present study in order to determine if the small, rural environment of Canby, Oregon, had a significant impact on the Oregon normative data for this age group. In other words, were the statistically significant differences between the Canby, Oregon, and Midwest DSS normative data truly due to geographical differences, or were the results of the present study contaminated by Canby's degree of urbanization?

Considering the results of the present study and those reported by McCluskey (1984), it becomes apparent that much more research is

needed before Lee's (1974) normative data may be used unequivocally in different geographical locations. Until more information pertaining to the effect of geographical differences on the DSS scores of children is obtained, clinicians run the risk of misdiagnosing or inaccurately assessing a child's level of grammatical development. Hopefully research will continue to investigate the effect of geographical differences on the DSS scores of children and will continue to develop specific geographical normative data. Only when clinicians and/or researchers develop specific geographical DSS normative data, will clinicians have a reliable tool with which to assess a child's level of grammatical development.

SELECTED BIBLIOGRAPHY

BANKSON, N.W. (1977). The Bankson Language Screening Test. Baltimore:
    University Park Press.

BARLOW, M.C., & MINER, L.E. (1969). Temporal reliability of length-
    complexity index. Journal of Communication Disorders, 2, 241-
    251.

BARRIE-BLACKLEY, S., MUSSELWHITE, C., & ROGISTER, S. (1978). Clinical
    oral language sampling. Danville, IL: The Interstate Printers
    and Publishers, Inc.

BERNSTEIN, B. (1961). Social class and linguistic development: A
    theory of social learning. In A.H. Halsey, J. Floud, & A.
    Anderson (Eds.), Economy, education, and society. New York:
    Macmillan.

BETTS, E.A. (1934). An evaluation of certain techniques for the study
    of oral composition. Research studies in elementary school
    language, 9, 7-35. In S. Barrie-Blackley, C. Musselwhite, &
    S. Rogister, Clinical oral language sampling. Danville, IL: The
    Interstate Printers and Publishers, Inc.

BLAXLEY, L., CLINKER, M., & WARR-LEEPER, G. (1983). Two language
    screening tests compared with developmental sentence scoring.
    Language, Speech, and Hearing Services in Schools, 14, 38-46.

BLOOM, L. (1970). Language development: Form and function in emerging
    grammars. Cambridge, MA: MIT Press.

BRAINE, M.D. (1963). The ontogeny of English phrase structure: The
    first phase. Language, 39, 1-13.

BROWN, R. (1968). The development of wh-questions in child speech.
    Journal of Verbal Learning and Verbal Behavior, 7, 279-290.

BROWN, R. (1973). A first language: The early stages. Cambridge, MA:
    Harvard University Press.

BROWN, R., & FRASER, C. (1963). The acquisition of syntax. In C.N.
    Cofer, & B.S. Musgrave (Eds.), Verbal behavior and learning:
    Problems and processes. New York: McGraw-Hill.

BRUNING, J.L., & KINTZ, B.L. (1977). Computational handbook of sta-
    tistics (2nd ed.). Glenview, IL: Scott, Foresman and Company.

CARROW, E. (1974). A test using elicited imitation in assessing grammatical structure in children. Journal of Speech and Hearing Disorders, 39, 437-444.

CAZDEN, C. (1968). The acquisition of noun and verb inflections. Child Development, 39, 433-448.

CORNELIOUS, S. (1974). A comparison of the elicited language inventory with the developmental sentence scoring procedure in assessing language disorders in children. Unpublished Master's thesis, University of Texas. In E. Carrow, A test using elicited imitation in assessing grammatical structure in children. Journal of Speech and Hearing Disorders, 39, 437-444.

COWEN, P.A., WEBER, J., HODDINOTT, B.A., & KLEIN, J. (1967). Mean length of spoken response as a function of stimulus, experimenter, and subject. Child Development, 38, 191-203.

DALE, P.S. (1972). Language development: Structure and function. New York: The Dryden Press, Inc.

DALE, P.S. (1978). What does observing language mean? In G.P. Sackett (Ed.), Observing behavior, vol. I theory and application in mental retardation. Baltimore: University Park Press.

DUNN, L.M. (1965). Peabody Picture Vocabulary Test. Circle Pines, MN: American Guidance Service.

DUNN, L.M. (1979). Peabody Picture Vocabublary Test (Rev. ed.) Circle Pines, MN: Holt, Rinehart, and Winston.

ERVIN, S. (1964). Imitation and structural change in children's language. In E.H. Lenneberg (Ed.), New directions in the study of language. Cambridge, MA: MIT Press.

FLUHARTY, N.B. (1974). Preschool Speech and Language Screening Test. Cincinnati, OH: University of Cincinnati.

FRASER, C., BELLUGI, U., & BROWN, R. (1963). Control of grammar in imitation, comprehension, and production. Journal of Verbal Learning and Verbal Behavior, 2, 121-135.

FUJIKI, M., & WILLBRAND, M.L. (1982). A comparison of four informal methods of language evaluation. Language, Speech, and Hearing Services in Schools, 13, 42-52.

GEERS, A.E., & MOOG, J.S. (1978). Syntactic maturity of spontaneous speech and elicited imitations of hearing impaired children. Journal of Speech and Hearing Disorders, 43, 380-391.

HAYNES, W.O., PURCELL, E., & HAYNES, M.D. (1979). A pragmatic aspect of language sampling. Language, Speech, and Hearing Services in Schools, 9, 91-97.

JAMES, S.L., & BUTTON, M. (1978). Choosing stimulus materials for eliciting language samples from children with language disorders. Language, Speech, and Hearing Services in Schools, 9, 91-97.

JOHNSON, D.L. (1974). The influence of social class and race on language test performance and spontaneous speech of pre-school children. Child Development, 45, 517-521.

JOHNSON, W., DARLEY, F.L., & SPRIESTERSBACH, D.C. (1963). Diagnostic methods in speech pathology. New York: Harper & Row, Publisher, Inc.

JONES. P.A., & MCMILLAN, W.B. (1973). Speech characteristics as a function of social class and situational factors. Child Development, 44, 117-121.

KARNES, M. (1972). Game oriented activities for learning. "Scenes around us." Springfield, MA: Milton Bradley Co.

KOENIGSKNECHT, R. (1974). Statistical information on developmental sentence analysis. In L.L. Lee, Developmental sentence analysis. Evanston, IL: Northwestern University Press.

KRAMER, C.S., JAMES, S.L., & SAXMAN, J.H. (1979). A comparison of language samples elicited at home and in the clinic. Journal of Speech and Hearing Disorders, 44, 321-330.

LEE, L.L. (1974). Developmental sentence analysis. Evanston, IL: Northwestern University Press.

LEE, L.L., & CANTER, S.M. (1971). Developmental sentence scoring: A clinical procedure for estimating syntactic development in children's spontaneous speech. Journal of Speech and Hearing Disorders, 36, 315-340.

LIVELY, M.A. (1984). Developmental sentence scoring: Common scoring errors. Language, Speech, and Hearing Services in Schools, 15, 154-168.

LONGHURST, T.M. (1975). A review of Lee, Developmental sentence analysis. American Speech-Language-Hearing Association, 16, 429-430.

LONGHURST, T.M., & FILE, J.J. (1977). A comparison of developmental sentence scores from head start children collected in four conditions. Language, Speech, and Hearing Services in Schools, 8, 54-64.

LONGHURST, T.M., & GRUBB, S. (1974). A comparison of language samples collected in four situations. Language, Speech, and Hearing Services in Schools, 5, 71-78.

MATHIS, J. (1971). Comparison of amounts of verbal response elicited
     by a speech pathologist in the clinic and a mother in the home.
     Unpublished Master's thesis, Portland State University.

MENYUK, P. (1963). Preliminary evaluation of grammatical capacity
     in children. Journal of Verbal Learning and Verbal Behavior, 2,
     429-439.

MINER, L.E. (1969). Scoring procedures for the length-complexity index:
     A preliminary report. Journal of Communication Disorders, 2,
     224-240.

MINIFIE, F.D., DARLEY, F.L., & SHERMAN, D. (1963). Temporal reliability
     of seven language measures. Journal of Speech and Hearing Research,
     6, 139-148.

MUELLER, E. (1972). The maintenance of verbal exchanges between young
     children. Child Development, 43, 930-938.

MUSSELWHITE, C.R. (1975). Three variations of the imperative format of
     language sample elicitation. Unpublished Master's thesis,
     University of North Carolina. In S. Barrie-Blackley, C. Mussel-
     white, & S. Rogister, Clinical oral language sampling. Danville,
     IL: The Interstate Printers and Publishers, Inc.

MCCARTHY, D.A. (1930). The language development of the pre-school
     child. University of Minnesota, Institute of Child Welfare, Mono-
     graph Series IV. Minneapolis, MN: University of Minneapolis
     Press.

MCCLUSKEY, K.M. (1984). Developmental sentence scoring: A comparative
     study conducted in Portland, Oregon. Unpublished Master's thesis,
     Portland State University.

MCNEILL, D. (1970). The acquisition of language: The study of devel-
     opmental psycholinguistics. New York: Harper & Row.

NICE, M.M. (1925). Length of sentences as a criterion of a child's pro-
     gress in speech. Journal of Educational Psychology, 16, 370-379.

OLSWANG, L.B., & CARPENTER, R.L. (1978). Elicitor effects on the lan-
     guage obtained from young language-impaired children. Journal of
     Speech and Hearing Disorders, 43, 76-88.

ROBINSON, H.M., MONROE, M., & ARTLEY, A.S. (1962a). Before we read.
     Chicago, IL: Scott Foresman. Pp. 1, 2, 4, 10, 11, 14, 16.

ROBINSON, H.M., MONROE, M., & ARTLEY, A.S. (1962b). We read pictures.
     Chicago, IL: Scott Foresman. Pp. 1, 2.

ROBINSON, H.M., MONROE, M., & ARTLEY, A.S. (1962c). We read more pic-
     tures. Chicago, IL: Scott Foresman. Pp. 4, 16, 20, 28.

ROSENTHAL, J., & WEYBRIGHT, G. (1979). What is indirect language stimulation? Hearsay, 17, 1-4.

ROSENTHAL, J., & WEYBRIGHT, G. (1980). A new concept in language intervention: Indirect language stimulation. Journal of the Oregon Speech and Hearing Association, 18, 4-5.

ROSENTHAL, J., & WEYBRIGHT, G. (1983). Oh say what they see. Videotape Portland Center for Hearing and Speech.

SCOTT, C., TAYLOR, A., & WHITE, C. (1975). A comparison of home and clinic gathered samples. Paper presented at the American Speech and Hearing Association Annual Convention. In C.A. Kramer, S.L. James, & J.H. Saxman, A comparison of language samples elicited at home and in the clinic. Journal of Speech and Hearing Disorders, 44, 321-330.

SHATZ, M., & GELMAN, R. (1973). The development of communication skills: Modifications in the speech of young children as a function of listener. Monographs of the Society for Research in Child Development, 38, 1-38.

SHRINER, T.H. (1969). A review of mean length of response as a measure of expressive language development in children. Journal of Speech and Hearing Disorders, 34, 61-67.

SIEGEL, G.M. (1962). Prototypes of instructions to typists. Journal of Speech and Hearing Disorders Supplement, 100-102. In S. Barrie-Blackley, C. Musselwhite, & S. Rogister, Clinical oral language sampling. Danville, IL: The Interstate Printers and Publishers, Inc.

STALNECKER, L.D., & CREAGHEAD, N.A. (1982). An examination of language samples obtained under three experimental conditions. Language, Speech, and Hearing Services in Schools, 13, 121-128.

TEMPLIN, M.C. (1957). Certain language skills in children. Minneapolis, MI: University of Minnesota Press.

TILL, J.A., & BUFORD, C.D. (1979). Effect of negative verbal stimuli on the occurrence of negation in language samples. Language, Speech, and Hearing Services in Schools, 10, 111-119.

U.S. BUREAU OF THE CENSUS. (1963). Methodology and scores of socioeconomic status. Working paper No. 15, Washington D.C.

UTLEY, J. (1950). What's its name? "The three bears." Urbana, IL: University of Illinois Press.

VALENCIANO, M. (1981). Developmental sentence scoring sample size comparison. Unpublished Master's thesis, Portland State University.

WARNER, W.L., MEEKER, M., & EELLS, K. (1949). Social class in America. Chicago, IL: Science Research Associates.

WILSON, M.E. (1969). A standardized method for obtaining a spoken language sample. Journal of Speech and Hearing Research, 12, 95-102.

APPENDIX A

PARENTAL PERMISSION FORM

Dear Parents,

My name is Stacy Tilden-Browning and I am a graduate student in the Speech and Hearing Sciences Program at Portland State University. I am currently working on a Master's thesis entitled, "A Comparative Study of the Developmental Sentence Scoring Normative Data Obtained in Canby, Oregon, and the Midwest, for Children Between the Ages of 6.0 and 6.11 Years." In other words, I am interested in comparing the language of six year old children living in Canby with that of six year old children living in the Midwest. In order to accomplish this, I am asking first graders at Philander Lee and Howard Eccles Elementary Schools to be participants.

If you give permission for your child to participate, the following will occur:

1. S/he will be given a hearing screening in which s/he will raise her/his hand in response to a tone.
2. S/he will be given a vocabulary test in which s/he will point to pictures that match words spoken by myself.
3. S/he will talk with me at her/his school while playing with toys and looking at pictures. Our conversation will be tape-recorded.

The study will entail no dangers or risks to your child and will be supervised by Mary Gordon, thesis director from the Portland State University Speech and Hearing Sciences Program. In addition, your child's identity will remain anonymous. If at any time you wish to withdraw your child from the study, you will be free to do so.

If your child _____, may participate in the study, please complete the following information. It will be helpful in describing the study.

_____
Parent Signature

_____
Date

_____ / /
Child's Birthdate   Mo. Day Yr.

Occupation of primary wage earner:_____

Years of education of primary wage earner:_____

Please return this form with your child tomorrow. If you have any questions, please leave a message with the secretary at your child's school and I will return your call.

Thank You For Your Time,

Stacy Tilden-Browning

APPENDIX B

DEVELOPMENTAL SENTENCE SCORING CATEGORIES
AND REWEIGHTED SCORES

	INDEFINITE PRONOUNS OR NOUN MODIFIERS	PERSONAL PRONOUNS	MAIN VERBS	SECONDARY VERBS
1	it, this, that	1st and 2nd person: I, me, my, mine, you, your(s)	A. Uninflected verb: I see you. B. copula, is or 's: It's red. C. is + verb + ing: He is coming.	
2		3rd person: he, him, his she, her, hers	A. -s and -ed: plays, played B. Irregular past: ate, saw C. Copula: am, are, was, were D. Auxiliary am, are, was, were	Five early-developing infinitival complements: I wanna see (want to see) I'm gonna see (going to see) I gotta see (got to see) Lemme [to] see (let me [to] see) Let's [to] play (let [us to] play)
3	A. no, some, more, all, lot(s), one(s), two (etc.) other(s), another B. something, somebody, someone	A. Plurals: we, us, our(s) they, them, their B. these, those		Non-complementing infinitives: I stopped to play. I'm afraid to look. It's hard to do that.
4	nothing, nobody, none, no one		A. can, will, may + verb: may go B. Obligatory do + verb: don't go C. Emphatic do + verb: I do see.	Participle, present or past: I see a boy running. I found the toy broken.
5		Reflexives: myself, yourself, himself, herself, itself, themselves		A. Early infinitival complements with differing subjects in kernels: I want you to come. Let him [to] see. B. Later infinitival complements: I had to go. I told him to go. I tried to go. He ought to go. C. Obligatory deletions: Make it [to] go. I'd better [to] go. D. Infinitive with wh-word: I know what to get. I know how to do it.
6		A. Wh-pronouns: who, which, whose, whom, what, that, how many, how much I know who came. That's what I said. B. Wh-word + infinitive: I know what to do. I know who(m) to take.	A. could, would, should, might + verb: might come, could be B. Obligatory does, did + verb C. Emphatic does, did + verb	
7	A. any, anything, anybody, anyone B. every, everything, everybody, everyone C. both, few, many, each, several, most, least, much, next, first, last, second (etc.)	(his) own, one, oneself, whichever, whoever, whatever Take whatever you like.	A. Passive with get, any tense Passive with be, any tense B. must, shall + verb: must come C. have + verb + en: I've eaten D. have got: I've got it.	Passive infinitival complement: With get: I have to get dressed I don't want to get hurt With be: I want to be pulled. It's going to be locked
8			A. have been + verb + ing had been + verb + ing B. modal + have + verb + en may have eaten C. modal + be + verb + ing could be playing D. Other auxiliary combinations: should have been sleeping	Gerund: Swinging is fun. I like fishing He started laughing.

NEGATIVES	CONJUNCTIONS	INTERROGATIVE REVERSALS	WH-QUESTIONS
it, this, that + copula or auxiliary is, 's, + not: It's _not_ mine. This is _not_ a dog. That is _not_ moving.		Reversal of copula: _Isn't_ it red? _Were_ _they_ there?	
			A. who, what, what + noun: _Who_ am I? _What_ is he eating? _What_ _book_ are you reading? B. where, how many, how much, what...do, what...for _Where_ did it go? _How_ much do you want? _What_ is he doing? _What_ is a hammer _for_?
	and		
can't, don't		Reversal of auxiliary be: Is he coming? _Isn't_ he coming? _Was_ he going? _Wasn't_ he going?	
isn't, won't	A. but B. so, and so, so that C. or, if		when, how, how + adjective _When_ shall I come? _How_ do you do it? _How_ big is it?
	because	A. Obligatory do, does, did: _Do_ they run? _Does_ _it_ bite? _Didn't_ _it_ hurt? B. Reversal of modal: _Can_ you play? _Won't_ _it_ hurt? _Shall_ _I_ sit down? C. Tag question: It's fun, _isn't_ _it_? It isn't fun, _is_ _it_?	
All other negatives: A. Uncontracted negatives: I can _not_ go. He has _not_ gone. B. Pronoun-auxiliary or pronoun-copula contraction: I'm _not_ coming. He's _not_ here. C. Auxiliary-negative or copula-negative contraction: He _wasn't_ going. He _hasn't_ been seen. It _couldn't_ be mine. They _aren't_ big.			why, what if, how come how about + gerund _Why_ are you crying? _What_ _if_ I won't do it? _How_ _come_ he is crying? _How_ _about_ coming with me?
	A. where, when, how while, whether (or not), till, until, unless, since, before, after, for, as, as + adjective + as, as if, like, that, then I know _where_ you are. Don't come _till_ I call. B. Obligatory deletions: I run faster _than_ you (run) I'm _as_ big _as_ a man (is big) It looks _like_ a dog (looks) C. Elliptical deletions (score 0) That's _why_ (I took it) I know _how_ (I can do it) D. Wh-words + infinitive: I know _how_ to do it. I know _where_ to go.	A. Reversal of auxiliary have: _Has_ he seen you? B. Reversal with two or three auxiliaries: _Has_ he been eating? _Couldn't_ he have waited? _Could_ he have been crying? _Wouldn't_ he have been going?	whose, which, which + noun _Whose_ car is that? _Which_ _book_ do you want?

(from Lee, _Developmental Sentence Analysis_, 1974).

APPENDIX C

LEE'S GUIDELINES FOR THE ELICITATION OF
ORAL LANGUAGE SAMPLES

1. Use appropriate stimulus materials. In selecting stimulus materials, one should consider the child's age, sex, interests, intellecual level, and severity of handicap.

2. Try to elicit high-level grammatical forms. One should use highlevel grammatical forms such as past tense, modal verbs, plural pronouns, etc., so that the child has an opportunity to use them himself in response.

3. Try to elicit complete sentences. When a child is not talking, one may resort to questions such as "What's this?," "What color is this?," and "Where is the boy?." Questions such as these may elicit short answers some of the time, however, they may also elicit single-word responses. One should discontinue using such questions as soon as possible. Often if one interacts with or talks about the stimulus materials without demanding a response from the child, the child will spontaneously respond.

4. Repeat what the child says. By repeating what the child says, one may clarify what the child said, as well as produce an invaluable guide for transcription.

(from Lee, <u>Developmental Sentence Analysis</u>, 1974).

APPENDIX D

LEE'S CRITERIA FOR SELECTING THE CORPUS
FOR GRAMMATICAL ANALYSIS

1. The corpus should consist of fifty complete sentences. A complete sentence contains a noun/pronoun and verb in subject-predicate relationship. A sentence does not need to be grammatically complete or correct. The following sentences would be considered complete:

> "It's cold."
> "Mommy washing dishes." (lexical V washing present although auxiliary verb is missing)
> "Stop doing that!" (imperative sentence with subject you understood)

The following sentences would be considered incomplete:

> "Daddy home last night." (copula was omitted)
> "You guys better get on the train." (main verb had omitted)
> "Hitting the tree." (subject omitted)

2. The speech sample must be a block of consecutive utterances. The clinician should try to include the child's "best" performance in the sample and should scan his/her transcript to find the section where a block of consecutive utterances would include his/her "best" utterances.

3. All utterances in a language sample must be different. No repetitions of sentences are to be included.

4. Unintelligible utterances should be excluded from the corpus. If the clinician is in doubt about any part of an utterance that affects the grammatical structure, then the utterance should be discarded.

5. Echoed utterances should be excluded from the corpus. The clinician is interested in the child's self-formulated grammatical structures. Sentences which are first formulated by the clinician and then echoed by the child must be discarded.

(from Lee, <u>Developmental Sentence Analysis</u>, 1974 and Lively, Developmental Sentence Scoring: Common Scoring Errors, <u>Language, Speech, and Hearing Services in Schools</u>, 15, 1984).

DEVELOPMENTAL SENTENCE SCORING RECORD FORM

NAME: BIRTHDATE: SENTENCE SAMPLE	Ind Pro Noun Mod	Per Pro	Main Verb	Sec Verb	Neg	Conj	Int Rev	Wh-?	Sent Point	Total
1. What is it?	1		1					2	1	5
2. Is that horse trucker?	1		1					-	0	2
3. This doen't stand up very good.	1		6		7				1	15
4. I don't need that.	1	1	4		4				1	11
5. (After lunchtime), he needs to go to the truck.		2	2	5					1	10
6. The farmer will try.			4						1	5
7. He did try.		2	6						1	9
8. Other farmer did.	3		inc						0	3
9. I'm gonna play with this.	1	1	2	2					1	7
10. (The) baby is sleeping on the couch.			1						0	1
11. This truck takes to the doctor.	1		2						0	3
12. How (do you) open the truck?			-					5	0	5
13. (But) how does he drive them there?		2,3	6					5	1	17
14. Here's the doctor.			1						1	2
15. Get the farmer out.			1						1	2
16. The farmer needs to be at the doctor first.	7		2	7					1	17
17. He tried on the thing but it didn't work.	1	2	2,6		7	5			1	24

	Ind Pro Noun Mod	Per Pro	Main Verb	Sec Verb	Neg	Conj	Int Rev	Wh-?	Sent Point	Total
18. He falled off.		2	-						0	2
19. (The) Doctor's fixing him.		2	1						0	3
20. Here we go.		3	1						1	5
21. She'll be all right.		2	4						1	7
22. (The) baby needs to go in beddie.			2	5					0	7
23. The other dad is all right.	3		1						1	5
24. There's another dad.	3		1						1	5
25. (The hospital said that) the mommy and the dad are all right now.			2			3			1	6
26. (Yeah) I got them.		1,3	2						1	7
27. Mommy needs to get into the truck.			2	5					1	8
28. Mommy has to walk.			1	3					1	5
29. (Yeah) she can take home.		2	4						0	6
30. This daddy can.	1		inc						1	2
31. She's gonna hold her little baby.		2,2	1	2					1	8
32. She has to take a bath.		2	1	3					1	7
33. (Ah) she can't get in the bath thing.		2	4		4				1	11
34. There she is.		2	1						1	4
35. She's all clean.	3	2	1						1	7
36. Where's the towel?			1					2	1	4
37. What's this?	1		1					2	1	5
38. (I bet) she can't sit on the couch.		2	4		4				1	11
39. (I bet) dad can.			inc						1	1
40. There's two dads.	3		-						0	3

	Ind Pro Noun Mod	Per Pro	Main Verb	Sec Verb	Neg	Conj	Int Rev	Wh-?	Sent Point	Total
41. The other dad needs to get out.	3		2	5					1	11
42. Could you put dad out there?		1	6				6		1	14
43. Who wants to ride this horsie?	1		2	3				2	1	9
44. (If she falls off) she has to go to the doctor.		2	1	5					1	9
45. The baby hurt herself on the horsie.		5	1						1	7
46. She's gonna be all right.		2	1	2					1	6
47. The trucks go into the hospital.			1						1	2
48. The doctor says.			2						1	3
49. How can the baby get out?			4					5	1	10
50. There she is.		2	1						1	4

TOTAL   342
Divide by 50   6.84

(from Lee, Developmental Sentence Analysis, 1974
and McCluskey, Developmental sentence scoring:
A comparative study conducted in Portland,
Oregon. Unpublished Master's thesis, Portland
State University, 1984).

APPENDIX F

LEE'S RULES FOR SEPARATING AND
COMBINING SENTENCES

1. Interjections and nouns in direct address do not receive any DSS score, so therefore, it is not necessary to separate them out or to include them in the transcription.

2. Question markers must be noted because they receive a DSS score.

3. Imperative interjections, such as, "look," "lookit," and "see" and sentence tags, such as, "I know," "I guess," and "You know," etc. are separated out and given sentence status. One must listen carefully to the intonation of utterances and mark off sentence tags with commas. The same sentence said with a different intonation may be a complete sentence, i.e., "I see (that) you found it."

Concerning conjunctions:

1. Sentences which begin with conjunctions are considered complete sentences, but the initial conjunction is not scored unless it is introducing a dependent clause.

2. Only one "and" conjunction is allowed per sentence when the "and" connects two independent clauses.

3. If the conjunction "and" is used in a series, a compound subject, or a compound predicate, it does not require the sentence to be broken up.

4. Internal conjunctions other than "and" do not require the sentence to be broken up.

5. At the clinician's discretion, the rules for the conjunction "and" may be applied to any other overused conjunction.
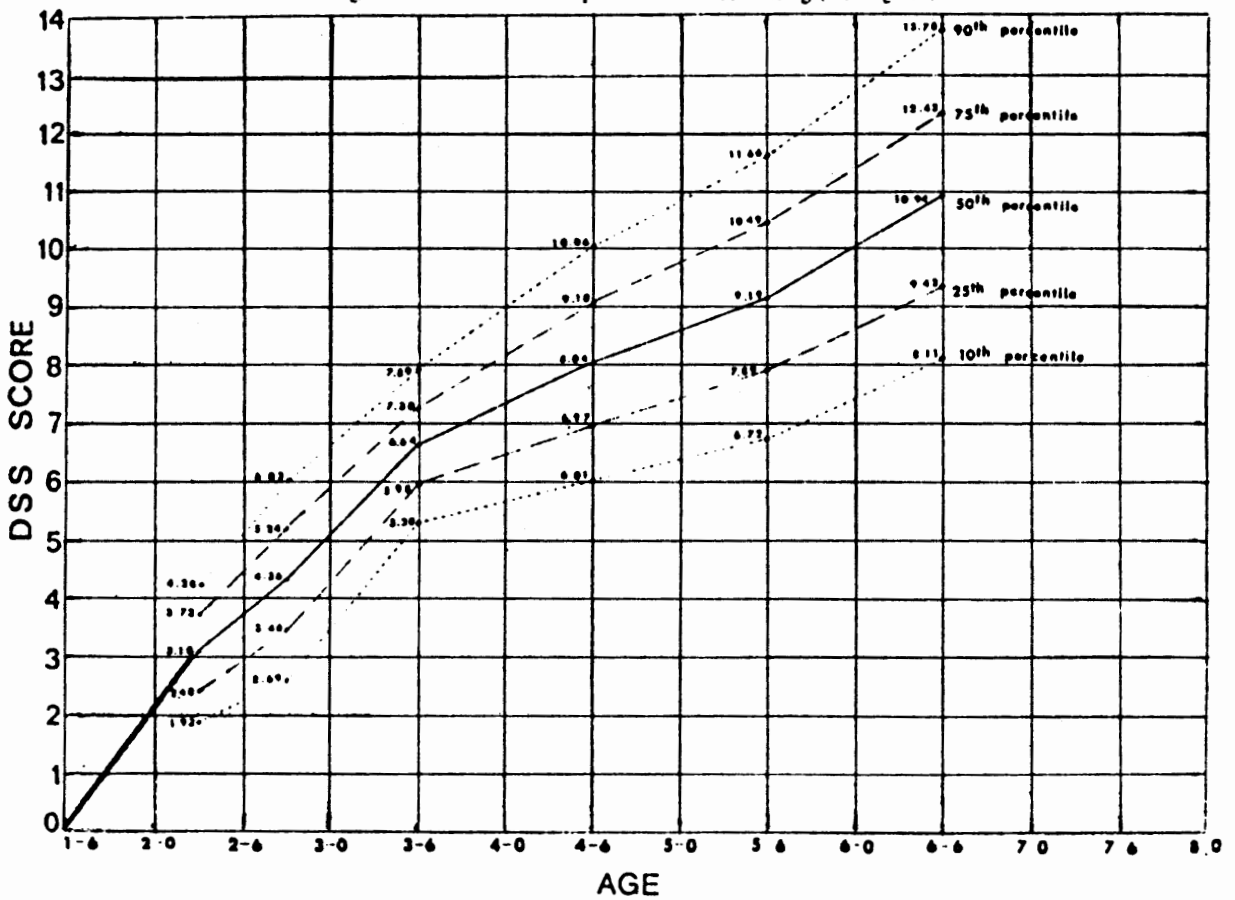
If a child's utterance contains both a pre-sentence structure and a complete sentence, a separation is made if the sentence is an independent clause. The fragment is classified as a pre-sentence type and the independent clause is classified as a complete sentence, i.e., "A cookie because she's hungry." "...she's hungry" would be scored.

(from Lee, <u>Developmental Sentence Analysis</u>, 1974).

APPENDIX G

LEE'S "NORMS FOR DEVELOPMENTAL SENTENCE SCORING"

Figure 1. Norms for Developmental Sentence Scoring (Reweighted)

(from Lee, _Developmental Sentence Analysis_, 1974).