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Second Grade Academic Performance in Normal Children, Children with a History of, and Children with Expressive Language Delay

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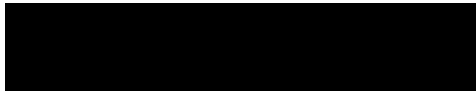
The abstract and thesis of Kathleen Ann Clancy for the Master of Science in Speech Communication: Speech and Hearing Sciences were presented November 1, 1994, and accepted by the thesis committee and the department.

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ABSTRACT

An abstract of the thesis of Kathleen Ann Clancy for the Master of Science in Speech Communication: Speech and Hearing Science presented November 1, 1994.

Title: Second Grade Academic Performance In Normal Children, Children With A History Of, and Children With Expressive Language Delay.

Interest in children who are diagnosed with expressive language delay has increased over the years. This has resulted in follow-up studies which have suggested that these children would have difficulties in academics during their elementary school years (Hall & Tomblin, 1978; Weiner, 1974) The current study sought to determine if children with a history of and children with continued expressive language delay would have problems with academics once they reached the second grade. The Peabody Individual Achievement Test (PIAT) was used to measure academic performance. It was chosen for it's reliable standardization and use of five different

subtest areas to determine overall academic achievement.

The purpose of this study was to determine if there are significant differences in academic performance on PIAT between three groups of second grade children with different language histories. The three groups are: 1) children with normal language history 2) children with a history of expressive language delay (HELD) who were identified as late to talk between 20 and 34 months of age, but who received a score at or above the tenth percentile in the second grade on the DSS (Developmental Sentence Scoring, Lee 1974), and 3) children with chronic expressive language delay (ELD) who were identified as late to talkers between 20 and 34 months of age, and received a score below the tenth percentile in the second grade on the DSS.

Significant differences were found between the ELD group and the Normal group in the areas of Math and General Information as well as the Total Test Score. The ELD group also performed significantly lower than the HELD group in the areas of Math and the Total Test Score. There were no significant differences found between the HELD group and the Normals or between the ELD and

HELD groups on the General Information subtest. These results were consistent with the most recent research article by Whitehurst and Fischel (1994) which looked at three longitudinal studies and found that by five years of age most children diagnosed with specific expressive language delay were performing within the normal range in various areas of language development.

**SECOND GRADE ACADEMIC PERFORMANCE IN
NORMAL CHILDREN, CHILDREN WITH A HISTORY OF,
AND CHILDREN WITH EXPRESSIVE LANGUAGE DELAY**

by

KATHLEEN ANN CLANCY

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

**MASTER OF SCIENCE
in
SPEECH COMMUNICATION:
SPEECH AND HEARING SCIENCES**

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CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

Introduction

Retrospective studies have shown that children diagnosed with early language delay are at risk for academic difficulties (Hall & Tomblin, 1978, Aram, Ekelman, & Nation, 1984). Aram and Nation's 1980 research study found that 40% of children diagnosed in preschool were placed in elementary classrooms other than the regular education classroom (educational resource room, self contained classes, etc.) and 40% of those children were observed to have persisting speech and language problems. Unfortunately retrospective studies are not always able to provide sufficient statistical information regarding diagnosis and initial intake data. This data is important for future researchers in that it assures they are examining the same aspects of children's speech and language development that have been seen in previous studies. Consistency in diagnostic and intake data allows for more valid studies of speech-

language behaviors. When it is clear that the diagnostic and intake data are similar for separate studies, there is no longer the chance that different researchers are only assuming they are looking at the same speech-language disorder. Longitudinal studies are able to provide this consistency in research. They are designed to collect detailed information on the children's baseline functioning and subsequent development in their speech and language maturation. Research using longitudinal studies involving children with early language delays have begun to appear. These studies have formed clearer descriptions of early language delay than those seen in the retrospective studies. A diagnosis of specific expressive language delay (SELD) has been used for children whose cognitive and receptive abilities exceed their expressive language. Most longitudinal studies involving SELD children are concerned with their preschool development. These studies show a significant number of children diagnosed with specific expressive language delay continue to have language problems by the end of preschool

(Rescorla & Schwartz, 1990; Paul, 1993). Because academic performance relies on an underlying proficiency in language use, children with SELD may be at risk for future academic difficulties. Few studies have moved beyond preschool to examine the SELD child of school age and determine if the prediction of academic difficulty is met. Although Scarborough and Dobrich in their 1990 research study have shown academic problems in a small group of children with a history of expressive language delay, additional longitudinal studies concerning outcomes of SELD children at school age are needed to provide a more accurate picture of how their early language delay effects later academic performance. This study was conducted in a effort to provide this information.

Statement Of Purpose

The purpose of this study is to compare the academic performance on a standardized achievement test of three groups of second grade children with different language histories. The three

groups are: children with normal language, children with a history of expressive language delay (HELD), and children with chronic expressive language delay (ELD). This study will attempt to determine whether expressive language delayed children and those with a history of language delay will perform significantly lower than their normal language peers on a test of academic achievement.

The research question to be answered is: Do children with differing rates of expressive language development vary significantly from one another on a standardized test of academic achievement?

The following research hypothesis is posed to answer that question. Second grade children, diagnosed with history of expressive language delay or with chronic expressive language delay will perform significantly lower than normal children in general scholastic attainment as evidenced on the five subtests of the Peabody Individual Achievement Test (PIAT): mathematics, reading recognition, reading comprehension, spelling, and general information.

The null hypothesis is as follows: No significant performance differences on the PIAT subtests will be seen among normal children and children with history of expressive language delay or children with chronic expressive language delay in the second grade.

Definition Of Terms

The following definitions will be used throughout this study:

1. Developmental Sentence Score (DSS) (Lee, 1974): A method of quantification of syntactic complexity of children's language.

Utterances from spontaneous language samples containing a subject-predicate relationship are scored for constituents of eight grammatical categories according to Lee's (1974) criteria. Lee has established norms for the DSS.

2. Expressive Language Delay Subjects (ELD): Subjects who were identified as late to talk as evidenced by a vocabulary of less than fifty different words between 20 and 34 months of age by parent report, using the Language Development Survey (LDS) by Rescorla (1989), and who received a score below the tenth percentile on the DSS in the second grade.

3. History of Expressive Language Delay Subjects (HELD): Subjects who were identified as late to talker as evidenced by a vocabulary of less than fifty different words between 20 and 34 months of age by parent report, using the LDS but who received a score at or above the tenth percentile in the second grade on the DSS.

4. Normal Language Subjects: Subjects who produced more than fifty different words by parent report on the LDS when they were between 20 and 30 months and who scored at or above the tenth percentile on the DSS in second grade.

CHAPTER II

REVIEW OF THE LITERATURE

Over the past ten years the interest in children who have specific expressive language delay or SELD has increased. Initial investigations attempted to formulate an accurate diagnosis of SELD. A criterion of less than 50 words in the vocabulary of a two to three year old child has become one standard for early diagnosis (Paul, 1993; Rescorla and Schwartz, 1990; Scarborough & Dobrich, 1990) and is used by several of the studies reviewed below. Recent research has examined how children with SELD begin to develop their language. Follow-up studies (Aram and Nation, 1980; Rescorla and Schwartz 1990) reported that from 40-60% of SELD children have ongoing problems with language development.

Researchers investigated the areas of phonology, semantics, syntax, pragmatics, and narrative skills during the preschool years. Much of the research data available on the older SELD child is retrospective data. Several of these studies use parent report as a major source of information. Many studies show continued problems

in language skills and academic performance for the SELD child. Demands of the school curriculum require higher level language skills and the acquisition of literacy skills which are language-based. This may be problematic for a child who currently has expressive language difficulties or who has a history of difficulty. This study analyzes academic performance in children with a history of expressive language delay (HELD) and continued expressive language delay (ELD) during the second grade. A review of the literature pertaining to retrospective studies of outcomes of speech and language delay, SELD in the preschool, predicting academic success, and SELD children from preschool to second grade, follows.

Retrospective Studies Of Outcomes Of Speech And Language Delay

As children enter elementary school the focus of education changes from language acquisition to the broader use of language in the form of academics. This focus on academics continues throughout the child's school career. A single case study of a sixteen year old boy who was diagnosed as language delayed at four was performed by

Weiner (1974). At four years this child had a small vocabulary of primarily single words. Weiner states that the child appeared to have adequate comprehension skills. In high-school he was seen as friendly and cooperative when interacting with adults but peer interactions were strained. IQ scores were consistent from those performed five years earlier. Throughout his schooling the child's greatest area of difficulty was in language usage and associated skills such as reading. His speech was marked with misarticulations and gross errors in syntax. Despite the fact that the boy, his family, and his school were positive and supportive, many problems continued to be observed. Weiner felt that his language difficulties would affect his communication, social abilities, future economic viability, and education.

Hall and Tomblin (1978) conducted a retrospective study of thirty-six children diagnosed with speech and language disorders at a mean age of approximately six years. The children were placed in two groups, articulation only and language plus articulation disorders. When the children were between the ages of twenty-two and twenty-three, parent questionnaires were sent out and results from

standardized test administered at six were reviewed. The two standardized achievement tests reviewed were The Iowa Tests of Basic Skills (ITBS) and The Iowa Tests of Educational Development (ITED). Fifty percent of the questionnaires regarding the language involved children indicated the parents felt there were continued language problems. Only one parent indicated concern of continued articulation difficulties. The children who were language impaired showed consistently lower overall achievement test scores than the articulation group during grades three to eight. The area of most difficulty was reading. This occurred in all grades except third. Language was the next weakest area and was most prominent during fourth, fifth, sixth and seventh grade. Work study and mathematics were better but still problem areas. Hall and Tomblin suggested further studies be conducted to determine the relationship between language and specific educational tasks. They then concluded that language delayed children showed more difficulties in communication, reading and other academic areas than children with articulation problems.

A retrospective study was conducted by King, Jones, and Lasky (1982). They assessed fifty subjects from age thirteen to twenty who were initially diagnosed between the ages of three and five. The subjects were separated into five different groups; those who had no speech, language disorders with delayed speech, articulation problems, language plus articulation, and articulation plus fluency problems. The information gathered was primarily through parent interview. King, Jones and Lasky found that forty-eight of the children had been recommended for speech-language services and forty-seven received treatment. Of 42% of the subjects, parents reported they felt their children continued to have some form of communication difficulty. The majority of these claims came from parents whose children were classified as having no speech or were language disordered with speech delay. These reports also indicated that 24% of the subjects themselves felt that they continued to have communication problems. Difficulty with school performance in one or more areas was reported for 52% of the subjects. Subjects were enrolled in a variety of classroom settings to include: hearing impaired, learning disabilities, ungraded programs, and vocational

educational programs. While King et. al. state that their study found residual communication problems they felt this did not support previous findings of continued poor academic performance.

Unfortunately the subjects were not given a standardized academic test as a more universal manner of comparing academic performance.

Silva, Justin, McGee, and Williams (1984) conducted a follow-up study with a group of eight hundred and seventy-two seven year old children with delayed speech development. They looked at the areas of motor skills, language and reading development, intelligence, and behavioral characteristics. The children were followed from their original assessment at three years of age. These children were part of the Dunedin Multidisciplinary Child Development Study. Several standardized tests were used to assess the children. These included the Dunedin Articulation Check, Basic Motor Ability Test, Illinois Test of Psycholinguistic Abilities, Burt Rearranged Word Reading Test, Wechsler Intelligence Scale for Children-Revised, and a parent/teacher report behavioral scale called the Rutter Child Scale. Articulation testing showed forty-one

boys and sixteen girls continued to be speech delayed. The speech delayed group was found to have a mean IQ of approximately one standard deviation below the rest of the subjects. The speech delayed group was then split into the low IQ group (less than 90) and the group with IQs of 90 or greater. Twenty three children or 46% of the speech delayed group fell into the low IQ speech group. In the areas of motor skills, language, reading, and behavioral problems the children in the low IQ speech group scored significantly lower than the normal IQ speech delayed group and the remainder of the sample. The low IQ speech delayed group's reading scores indicated a one year delay. The subjects with normal IQ and only speech delay still scored significantly lower than the remainder of the sample in the areas of verbal comprehension, reading and teacher report of behavioral problems.

Aram, Ekelman, and Nation (1984) conducted a follow-up study of twenty children with language disorders who were diagnosed during preschool. These children were originally administered a variety of standardized tests: Peabody Picture Vocabulary Test (PPVT), Assessment of Children's Language Comprehension (ACLC),

Vocabulary Usage Test(VUT), Northwestern Syntax Screening Test (NSST), Templin's Picture Sound Discrimination Test, and the Leiter International Performance Scale. Between the ages of thirteen years three months and sixteen years ten months, the sixteen boys and four girls were re-tested. Aram, Ekelman, and Nation predicted that Performance IQ would be higher than Verbal IQ because of the children's language deficits. This was true for fifteen of the twenty subjects. They found that the Leiter International Performance Scale was the best single predictor of future performance for their subjects. Their study led them to conclude that preschool language disorders are indicative of possible behavioral problems, continued language difficulties and academic problems as the children progress through school.

The majority of the preceding studies suggest that children diagnosed with speech and language delays were at risk for academic problems as they matured. All of the studies found continued language difficulty in some of their subjects. It is difficult in some cases to determine if the subjects presented expressive language delays only or in combination with other

disorders. The following research articles look at preschool children who were diagnosed specifically with early expressive language delay.

SELD In The Preschool Child

According to several researchers 40-50% of children diagnosed with expressive language delay at two years of age continue to have difficulties at three years of age. The following studies take a closer look at preschool children who are diagnosed with specific expressive language delay. How the delay changes as the children mature is important to their later classification as HELD or ELD, and how they will be subsequently served.

Rescorla and Schwartz in 1990 conducted a follow-up study of twenty-five three and four year old boys originally diagnosed with SELD between 24-31 months. MLU and Index of Productive Syntax (IPSyn, Scarborough, 1990) scores were used to assess continued difficulties. Their research showed that while approximately one half of the subjects were able to catch up by three the remainder showed continued problems by four. Almost one half of the boys

showed continued problems as evidenced using MLU. Of the sixteen three year old children, six were more than two standard deviations below the norm in MLU. Of the seven boys who were 42 months old, four scored more than three standard deviations below the norm in MLU. One of the two 4 year olds scored more than four standard deviations below the norm in MLU. The results on the IPSyn showed that all but seven of the twenty-five subjects scored at least one standard deviation below normal. Rescorla and Schwartz concluded that while some of the delayed subjects may have had an increase in MLU the majority still had difficulties with expressive syntax. Their correlational analysis suggested that a larger lag in expressive language coupled with older age at diagnosis indicates a poorer outcome.

A more detailed study of continued language problems in this population was conducted by Paul in 1993. The research focused on the developmental patterns of change during the preschool years in children with specific expressive language delay. This study showed that while expressive vocabulary deficits were primary problems in toddlers, phonological and syntactic problems predominated during

ages three and four. Paul found that SELD children were performing within the normal range in receptive skills and expressive vocabulary by three years of age. At three years, 74% of the thirty-seven SELD children continued to score below normal in expressive syntax, articulation, or both despite their vocabulary growth. The social skills of half the three year old SELD subjects were determined to be below the normal range using the Vineland Adaptive Behavior Scales. At four, the number of children who scored below normal in expressive syntax, articulation, or both areas had dropped to 67%. Two thirds of the children who were having phonological difficulties at three years improved by the time they were retested at four years of age. In comparing the testing at ages three and four, Paul's study showed the pattern of deficits had changed. Articulation and expressive syntax deficits were seen at three years, but by four years expressive syntax was the primary area of delay.

In 1993 Paul and Alforde looked specifically at the grammatical morpheme acquisition of 34 four year olds who were originally diagnosed with specific expressive language development. Fifteen of

the thirty four children scored within the normal range in MLU at the time of the follow-up study. These children were seen as having a history of expressive language delay (HELD). The other nineteen children fell more than one standard deviation below the mean in MLU for their age. Thirteen morphemes were studied. The result of the research indicated that the morphological acquisition of the SELD children occurred in a manner that followed normal acquisition. The children with a history of expressive language delay (HELD) who had MLUs at the same level as the normal children could be assumed to have acquired the same number of morphemes as the normal group. This did not occur. The HELD group had not acquired four of the morphemes which would be expected for their MLU. The children with continued expressive language delay did not acquire the morphemes predicted by their MLUs either. This research suggests that both groups of children who were diagnosed with SELD have difficulty with grammatical morpheme acquisition even when they perform within normal limits in regards to MLU.

Predicting Academic Success

Bishop and Edmundson (1987) found narrative skills to be a reliable predictor of school success in preschoolers with language problems. Paul and Smith (1993) looked at the narrative skills of four year olds with SELD because of the narrative's predictive ability and it's use in the development of literacy skills (Westby, 1989). Twenty-three SELD subjects were selected for re-evaluation. Ten of the children had a history of expressive language delay (HELD) and thirteen continued to have an expressive language delay (ELD). The Bus Story Language Test (Renfrew, 1977) was used to assess narrative ability along with measures of lexical diversity, cohesive adequacy, and amount of informational units expressed. No difference was seen in the narrative ability of the HELD group as compared with normal children, but when compared to the ELD group, the HELD subjects did not perform significantly better in their lexical diversity, cohesive adequacy, or the amount of informational units expressed. The performance of the ELD group on all areas including narrative ability was shown to be significantly lower than those of the normal group. Paul and Smith suggest their results

indicate ELD children are at risk for academic difficulties due to their poor performance on the narrative tasks. HELD children may be at risk when they enter elementary school if they are not able to achieve and maintain performance within the normal range.

SELD Children From Preschool To Second Grade

One study has looked at SELD children continually through preschool and into second grade. Scarborough and Dobrich (1990) conducted a follow-up study of four SELD children through preschool at ages 24, 30, 36, 42, 48, and 60 months of age and again at the end of second grade when they were approximately 8 years old. Initially the children showed severe delays in syntax, phonology, and lexical semantics. By the end of preschool at 60 months they each showed a decrease in severity that approached normal. Each child continued to have one area that remained problematic. Continued difficulties were seen in phonology and/or syntax as opposed to a pure lexical deficit. By the second grade the SELD children were no longer performing within the normal range. Three of the four children with familial history of reading disabilities showed severe reading

problems. Three of the subjects performed low on math achievement testing, and all of the children scored at least one standard deviation below the norm on receptive vocabulary. Scarborough and Dobrich suggest that as children with SELD mature they will continue to have language and academic problems in school.

Whitehurst and Fischel (1994) reviewed several studies of children with SELD including three ongoing longitudinal studies. They stated that the three longitudinal studies were similar in finding specific expressive language delay to be a risk factor for later language related problems, as opposed to a disorder. The majority of children in the three longitudinal studies moved into the normal range of language performance by five years of age. Whitehurst and Fischel report that the three studies showed phonological performance within normal limits for all subjects by age five. All three studies showed normal expressive vocabularies throughout the follow-up despite the fact that small expressive vocabulary was the presenting complaint. Syntactic abilities were seen to be a continuing problem for the subjects in the preschool period. Using these longitudinal studies and others, Whitehurst and Fischel

concluded that SELD can be considered a risk factor in children below the age of five. After five years, if the children continue to have expressive language delay the risk factor appears to increase. Expressive language delay associated as a secondary symptom to other disorders, such as mental retardation, and expressive language delay accompanied by a receptive delay are seen by the authors to pose an even greater risk.

Summary

Several research projects have revealed that children diagnosed with specific expressive language delay have continued difficulties as they mature. While some of the preschool children may have reached the normal range of performance in MLU and vocabulary acquisition, others continued to have problems with articulation, expressive syntax, grammatical morphemes, lexical diversity, narrative skills, reading, and math as well as behavioral problems. Paul and Smith predicted possible academic risk for children with expressive language delay or history of expressive language delay. Scarborough and Dobrich (1990) demonstrated that

four second grade SELD subjects fell below normal limits in some academic skills. Additional research is needed for a more in depth look at second grade academic performance with this population. This study will provide information on second grade academic performance using a larger sample size of children with both expressive language delay and a history of expressive language delay.

CHAPTER III

METHODS AND PROCEDURES

Subjects

The children participating in this study were subjects in The Portland Language Development Project (PLDP), a longitudinal study of early language delay. Subjects for the current study were all those who participated in the second grade reevaluation for the PLDP.

Recruitment

Approval by the Human Subjects Research Review Committee was originally granted for the PLDP in 1987. The present study was approved in 1993. The subjects for the original PLDP were recruited from local pediatric clinics, radio announcements and newspaper advertisements. Parents who were interested completed a questionnaire which indicated the number of words produced by their toddler. Signed permission was obtained from the parents for all subjects participating in the study.

Group Assignment at Age Two

The subjects for this thesis project were selected from those participating in the PLDP. These included thirty-two of the original thirty-four from the SELD group, and twenty-seven of the original twenty-nine from the normal group. Those not included in this study chose not to participate in the second grade follow-up. At entrance into the PLDP children were assigned to one of two groups: specific expressive language delay (SELD), and normal language. The thirty-two children who were diagnosed with SELD produced fewer than fifty different words between 20 and 34 months. This information was gathered through parent report using the Language Development Survey (LDS). The LDS was shown to have high reliability, validity, 90% specificity and 90% sensitivity for identifying language delay in toddlers (Rescorla, 1989). This survey consists of a checklist with 300 of the most common words children use in early vocabularies.

Twenty-seven children with greater than fifty different words in their vocabulary between 20 to 34 months were placed in the normal language group. These children were matched to the SELD

group in the areas of age, socioeconomic status (SES), race, and sex ratio. The SES was obtained by using the Hollingshead Scale (Meyers & Bean, 1968). This is a two factor index combining occupational and education status of the parents, yielding weighted scores of 1 to 5, with 1 as the highest SES level and 5 as the lowest. As Table 1 shows, SES for the sample is middle class. This study is generalizable only to other middle class populations.

All children were screened by PLDP graduate research assistants at intake. The subjects passed hearing screening at 15dB or passed threshold testing at 25dB. IQ was assessed using the Bayley Scales of Infant mental Development (Bayley, 1969) with all children scoring 85 or greater. No significant difference was seen between the groups on the nonverbal items of the Bayley. The subjects were all informally screened through observation for neurological disorders and autism.

Table 1 shows the demographic information of the diagnostic groups upon intake. The table includes number of subjects, mean age, socioeconomic status (SES), gender, and race.

Table 1

Group Demographic Information At Intake

<u>Group</u>	<u>n</u>	<u>Mean Age At Intake (SD)</u>	<u>SES^a</u>	<u>Gender</u>	<u>Race</u>
Normal	27	25.1 mo (4.6)	2.6	56% male	85% Caucasian
SELD	32	25.3 mo (4.1)	2.6	80% male	93% Caucasian

a Based on a two factor index based on Myers and Bean (1968), where

1 is the highest and 5 is the lowest SES rating.

Group Assignment at Second Grade

The subjects were reassigned by the author, at second grade, into one of three groups. This was done on the basis of their original diagnosis at age two and their Developmental Sentence Score (DSS; Lee, 1974) in second grade. As the literature review indicated, deficits in SELD children changed over time. Although small expressive vocabulary was the initial complaint, expressive vocabulary size moved into the normal range by three years of age. The deficits that persisted involved expressive syntax (Paul, 1993; Rescorla & Schwartz, 1990; Whitehurst & Fischel, 1994). For this reason diagnostic groups were formed on the basis of expressive syntax performance when the subjects were reevaluated in second grade. The DSS was used as an index of expressive syntax. Spontaneous speech samples were collected in the second grade for each subject through an interview format, following Evans and Craig (1992). Samples were analyzed using Lee's (1974) guidelines for DSS scoring. Normal language performance was indicated if the child performed at or above the tenth percentile for age seven on the DSS, a score of 8.11. The normal language group were those children

identified initially as having normal language at age two and who performed above 8.11 on the DSS at second grade. The SELD group was divided into two subgroups on the basis of their second grade DSS score: history of expressive language delay (HELD) group, and the children with chronic expressive language delay (ELD) group. The HELD group consisted of subjects who were initially identified as SELD, as evidenced by a vocabulary of less than fifty different words between 20 and 34 months, and who by second grade had scored at or above 8.11 on the DSS. Children placed in the ELD group were originally diagnosed as SELD and continued to show deficits in expressive syntax as evidenced by DSS scores below 8.11 in second grade. Twenty-seven subjects originally diagnosed as SELD were classified as HELD in the second grade. Five of the original SELD subjects were placed in the ELD group at second grade. Twenty-seven were included in the normal group at second grade. Ages of the subjects ranged from 7 years 8 months to 8 years 7 months.

Table 2 shows the demographic information of the diagnostic groups upon second grade re-evaluation. The table includes number of subjects, mean age, and mean DSS rating.

Table 2

Group Demographic Information At Second Grade Re-Evaluation

<u>Group</u>	<u>n</u>	<u>Mean Age At Follow Up (SD)</u>	<u>2nd Grade Mean DSS Rating</u>
Normal	27	96.4 mo (2.6)	10.54
HELD	27	96.2 mo (2.8)	10.11
ELD	5	95.8 mo (1.4)	7.05

Procedures

Subjects were seen by graduate research assistants in the PLDP for follow-up evaluation during their second grade year as part of the longitudinal component of the PLDP. Fifteen minute speech samples were collected in an interview fashion, following Evans and Craig's guidelines (1992), and audiotaped. The interviewer, a graduate assistant working for the PLDP, asked the child to talk about his family members, school experiences, and free-time activities. Once the child had chosen a topic the interviewer allowed the child to dictate the direction of the conversation.

A transcription of the tape was made by the graduate student present at the time of taping. The DSS (Lee, 1974) was later used to analyze the spontaneous speech samples of each subject. This was done by a trained graduate assistant in accordance with the DSS guidelines.

Each subject was also administered the Peabody Individual Achievement Test (PIAT). The subjects were tested individually in a clinic room at Portland State University Speech and Hearing Department. Administration and scoring of the test was performed

by graduate research assistants and followed the instructions outlined in the test manual.

Instrumentation At Second Grade

A speech sample was collected on each of the subjects at the second grade. Fifteen minute speech samples were audiotaped. A Sony ECM-144 Electret condenser lavalier microphone and a Sony Dictator/ Transcriber BM-88 with Sony dictation cassette DC-30N were used to record the speech sample. The equipment was turned on after the instructions were given. DSS (Lee, 1974) analysis was performed on the spontaneous speech samples of each subject. The DSS is a standardized measure used to assess the syntactical structures found in the speech samples by assigning weighted scores to complete sentences. A complete sentence, according to the DSS, is marked by a noun and a verb in a subject-predicate alignment. Fifty sentences are the recommended number for analysis.

The following syntactic structures are analyzed using the DSS: indefinite pronouns or noun modifiers, personal pronouns, main verbs, secondary verbs, negatives, conjunctions, interrogative

reversals, and Wh-questions (Lee, 1974). Each class of syntactic structures are broken down and given weighted scores based on Lee's (1974) observations of the developmental order of acquisition. The lowest score for each class is a one, the highest score for each class is an eight. Each sentence is analyzed and given a score based on a total of all the scores from each syntactic class.

Normative data were collected by Lee (1974) using language samples from two hundred normal language Caucasian children, ages 2.0 to 6.11 years. Twenty male and female children make up each three month age group. The majority (197 of 200) of the subjects came from middle income families. Normative data consists of age equivalent and percentile rank. Validity was assessed by Lee (1974) using an internal consistency method with a coefficient alpha with a result of .71. Split-half reliability was measured to be .73. Category-total correlations were also performed along with intercategory correlations and analysis of individual grammatical categories. Interjudge reliability showed no significant differences between the DSS scores of two different judges. Stimulus material

differences, temporal reliability, and sentence sequence effects were also measured by Lee (1974) and found to have no significant effect.

The PIAT was chosen as a standardized method of determining academic performance. The test is comprised of five subtests: mathematics, reading recognition, reading comprehension, spelling, and general information. The mathematics portion of the test contains eighty-four multiple-choice problems. Each problem has four possible answers. The problems range in skill from matching and identifying numbers to geometry and trigonometry. Reading recognitions has eighty-four items as well. The reading levels range from preschool through high-school. Reading comprehension has only sixty-six items that are presented in two pages per item. The initial page presents a sentence for the subject to read silently. The second page is presented to the subject after s/he has read the first. This page contains four different drawings from which the subject is expected to choose one that most closely portrays the meaning of the sentence from the first page. The spelling subtest uses eighty-four multiple-choice questions that range in difficulty from kindergarten

through high-school. Response to these items vary from letter identification and word identification, to matching the correct spelling with a word used in a sentence. General information is tested with eighty-four questions which are read by the examiner to the subject. Responses are given verbally. The range of information is tested which includes: science, social studies, fine arts and sports. These subtests combine to produce a total score.

Standardization of the PIAT was accomplished throughout the United States by the American Guidance Service Inc.. The PIAT standardization subjects were limited to those attending regular education classes all day. Schools chosen included urban, suburban, and rural representation. Two hundred children were included per grade level, K-12. Children were drawn randomly from their schools. Sex was approximately 1:1, male:female. Ethnic distribution is as follows: 84% Caucasian, 11.3% African American, 4.3% other. Socioeconomic distribution was spread across twelve levels. Normative data consists of grade equivalent, age equivalent, percentile rank, and standard scores. Standard error of measurement was also provided for each grade level.

Test-retest reliability was calculated by the American Guidance Service Inc. for the PIAT with an average of .78%. To establish content validity the American Guidance Service Inc. administered trial tests seven times in six major cities over a seven year period. A review of national curriculum materials at each grade level was completed by the testing corporation as well to formulate test items. Concurrent validity was provided in the manual at .57 using the Peabody Picture Vocabulary Test and .36 using the Wide Range Achievement Test.

Data Analysis

Reliability

Graduate research assistants for the PLDP were trained to perform reliability measures. Eleven percent of the language samples used for DSS analysis were randomly selected and scored independently by a second graduate assistant. Transcription reliability of word by word agreement was performed on 11% of the subjects at 94% accuracy. Sentence choice reliability, of which noun-verb sentences would be used for DSS analysis, was calculated at

90% on eight percent of the subjects. Point by point reliability, when assigning DSS scores, was calculated on 14% of the language samples at 92% accuracy. Reliability for total DSS scores was 97% on eleven percent of the subjects. Interjudge reliability was established for the PIAT with concurrent scoring by two graduate assistants for 14% of the subjects' tests at the time of administration. Reliability was determined by comparing total test scores. This was measured to be 99%.

Statistical Analysis

Data was collected using the interval scale score on the PIAT. A parametric statistic was indicated in the comparison of total test scores and each subtest score for the three groups: ELD, HELD and normal. This complex design contains a three level independent variable (group classification) and six dependent variables (five subtests and a total score). The range, mean, and standard deviation were calculated for each dependent variable. A statistical analysis was performed using an ANOVA (analysis of variance) to calculate each dependent variable separately, to determine if there is a

difference among the groups, and whether they are significant for each variable. An alpha level of .05 was applied to determine statistical significance.

CHAPTER IV

RESULTS AND DISCUSSION

Results

The purpose of this study was to determine if there are difference in the academic performance on a standardized achievement test with three groups of second grade children: normal children, children with a history of expressive language delay (HELD), and children with continued expressive language delay (ELD).

The research question asked was: Do children with differing rates of expressive language development (normal, HELD, and ELD) vary significantly from one another on a standardized test of academic achievement?

The mean and standard deviation for each Peabody Individual Achievement Test (PIAT) subtest and total test score have been calculated and separated by language group. These are presented in Table 3.

Table 3

The PIAT Mean and Standard Deviation

<u>Subtest</u>	<u>Group</u>	<u>Mean</u>	<u>Sd</u>
Math	Normal	113.11	11.43
	HELD	111.26	11.99
	ELD	93.20	10.33
Reading	Normal	114.44	14.82
Recognition	HELD	112.30	17.11
	ELD	100.80	23.81
Reading	Normal	113.96	12.68
Comprehension	HELD	108.11	14.46
	ELD	103.40	18.35

Table 3 con't

The PIAT Mean and Standard Deviation

<u>Subtest</u>	<u>Group</u>	<u>Mean</u>	<u>Sd</u>
Spelling	Normal	106.93	11.57
	HELD	108.48	12.46
	ELD	103.40	18.35
General	Normal	116.22	12.78
Information	HELD	111.30	13.70
	ELD	99.60	9.29
Total Score	Normal	115.67	13.01
	HELD	112.89	12.64
	ELD	100.4	15.37

The data was analyzed using the Analysis of Variance (ANOVA) to determine if significant differences existed in the group scores. Statistical significance was determined at an alpha level of .05. Results of the ANOVA including the source (between and within groups), the total sum of squares, degrees of freedom, F-ratio (variance ratio), and P (significance level) are shown in Table 4.

Table 4

Analysis of Variance for The PIAT

<u>Source</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Squared</u>	<u>F-ratio</u>	<u>P</u>
---------------	-----------------------	-----------	---------------------	----------------	----------

Math Subtest					
Group	1695.755	2	847.877	6.282	.003*
Error	7558.652	56	134.976		

Reading Recognition Subtest					
Group	786.030	2	393.015	1.404	.254
Error	15678.207	56	279.968		

Reading Comprehension Subtest					
Group	715.408	2	357.704	1.943	.153
Error	10308.830	56	184.086		

Table 4 con't

Analysis of Variance for The PIAT

<u>Source</u>	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean Squared</u>	<u>F-ratio</u>	<u>P</u>
Spelling Subtest					
Group	117.428	2	58.714	.371	.692
Error	8863.793	56	158.282		
General Information Subtest					
Group	1245.046	2	622.523	3.681	.031*
Error	9469.496	56	169.098		
Total Score					
Group	1160.152	2	580.076	3.390	.041*
Error	9583.407	56	171.132		

Note. * Indicates subtests showing significant differences in performance between groups.

Significant differences in the Math Subtest, General Information Subtest, and the Total Score were indicated using the Analysis of Variance. A post-hoc test was administered using the Fisher's Least Significant Difference Test to determine which groups performed significantly lower. This is shown in Table 5.

Table 5

Fisher's Least-Significant-Difference Test Matrix of PairwiseComparison Probabilities

<u>Row</u>	<u>Group</u>
1	Normal
2	HELD
3	ELD

Math Subtest

	<u>1</u>	<u>2</u>	<u>3</u>
<u>1</u>	1.000		
<u>2</u>	0.560	1.000	
<u>3</u>	0.001*	0.002*	1.000

General Information Subtest

	<u>1</u>	<u>2</u>	<u>3</u>
<u>1</u>	1.000		
<u>2</u>	0.169	1.000	
<u>3</u>	0.011*	0.070	1.000

Table 5 con't

Fisher's Least-Significant-Difference Test Matrix of Pairwise

Comparison Probabilities

	Total Test Score		
	<u>1</u>	<u>2</u>	<u>3</u>
<u>1</u>	1.000		
<u>2</u>	0.563	1.000	
<u>3</u>	0.012*	0.027*	1.000

Note. * Indicates subtests showing significant differences in performance between groups.

The Fisher's Least Significant Difference Test found a significant difference in the ELD group as compared with both the Normals and the HELD group. The Math subtest was analyzed and showed a .001 significance level when the ELD group was compared to the Normal group. When the ELD group and the HELD group were compared a .002 significance was found in the ELD performance. Comparison of the General Information scores between the ELD and Normal groups showed a .011 significant difference in the ELD group. Total Test Score analysis showed a significant difference in the ELD group as compared to both the Normal group and the HELD group. These scores were .012 and .027 respectively.

Discussion

In all areas of significant differences, the ELD group performed significantly lower than the normal group. They also performed significantly lower than the HELD group on the Math Subtest and the Total Test Score. The HELD group showed no significant differences in performance as compared to the Normal group or the ELD group in any of the subtests or the total score.

As in the study by Scarborough and Dobrich (1990), the ELD children performed significantly lower in math. However, the ELD children in this study showed no significant difference in reading skills. It is interesting to note that the HELD group did not perform significantly lower than the Normal group, nor did it perform significantly higher than the ELD group in the areas of Reading, Spelling, or General Information. Despite significant differences in scores by the ELD group, all groups had means within the normal range. This is consistent with the longitudinal data mentioned in the study by Whitehurst and Fischel (1994).

The results of this study suggest that HELD children who have grown out of their expressive language delay by second grade, perform within the normal limits on measures of academic performance. The results also suggest that those children who have continued expressive language delay (ELD) in the second grade are significantly less advanced than the Normal group and children with a history of expressive language delay (HELD) in Math and General Information measures of academic performance. Although the ELD subjects performed significantly lower than the Normal group in

only two of the PIAT subtests, scores were lower in all subtests and the summation of these lead to a significant difference in the Total Score as compared with both the HELD and Normal groups.

The HELD group seems to have developed the necessary language skills needed for successful academic performance. However continued studies of the HELD and ELD subjects may show deficits in academic performance as demands increase at higher grades. This has been seen in several of the retrospective studies (Weiner, 1974; Silva et.al., 1984; Aram, Eckleman, & Nation, 1984).

CHAPTER V

SUMMARY AND IMPLICATIONS

Summary

Current research suggests that children who were diagnosed with expressive language delay during preschool would show difficulties in academics during their elementary school years (Scarborough and Dobrich, 1990). This study sought to determine if children with a history of continued expressive language delay would have problems specifically with academics once they reached the second grade. The Peabody Individual Achievement Test (PIAT) was used to measure academic performance. It was chosen for its reliable standardization and use of five different subtest areas to determine overall academic achievement.

The purpose of this study was to determine if there was a significant difference in the academic performance on the PIAT of the three groups of second grade children with different language histories. The three groups are: 1) children with normal language history who produced more than fifty different words by parent

report on the Language Development Survey (LDS) when they were between 20 and 30 months and who scored at or above the tenth percentile on the Developmental Sentence Score (DSS) in second grade, 2) children with a history of expressive language delay (HELD) who were identified as late to talk as evidenced by a vocabulary of less than fifty different words between 20 and 34 months of age by parent report, using the LDS but who received a score at or above the tenth percentile in the second grade on the DSS, and 3) children with chronic expressive language delay (ELD) who were identified late to talk as evidenced by a vocabulary of less than fifty different words between 20 and 34 months of age in parent report using the LDS , and who received a score below the tenth percentile in the second grade on the DSS.

Significant differences were found between the ELD group and the Normal group in the areas of Math and General Information as well as the Total Test Score. The ELD group also performed significantly lower than the HELD group in the areas of Math and the Total Test Score. There were no significant differences found

between the HELD group and the Normals or between the ELD and HELD groups on the General Information subtest.

Implications

Clinical

Children with chronic expressive language delay (ELD) were seen in this study to perform significantly below normal language peers. At this time, differentiating which preschool children will outgrow their language delays and which children will have continued expressive language delays has not been possible. Whitehurst and Fischel (1994) suggest that determining which children have expressive language delay as a primary condition and which have it as a secondary condition will assist researchers in determining which children are at greater risk for later difficulties. Children diagnosed with expressive language delay as their primary disorder may benefit from speech-language services delivered in a consultative form to parents and teachers. Children who have expressive language delay as a secondary condition to mental retardation, autism, hearing loss and others, may benefit from

direct early intervention services to decrease the effects of their language deficits. It is important to note that the socioeconomic status for the subjects in this study was calculated as middle class. The implications of this study are generalizable only to other middle class populations.

Research

In agreement with earlier research by Scarborough and Dobrich (1990), this study found that children with chronic expressive language delay (ELD) performed significantly below the Normal group in academic testing. While the ELD children performed significantly below the Normal group they scored within normal range as seen in the studies reviewed by Whitehurst and Fischel (1994). Continued research of children who have expressive language delay is called for. The sample size of ELD children in this study was small and additional research would benefit from a larger sample. The results of testing for the ELD group indicated that their mean was in the normal range, but when looking at their standard deviation for the Math subtest and Reading Recognition subtest application of the

standard deviation would remove them from the normal range. A larger sample size would stabilize the scores and help determine more definite developmental patterns of the ELD child.

As seen in the results the ELD subjects performed significantly lower than the Normal group, and HELD subjects consistently scored between the Normal group and the ELD group. Follow-up studies beyond second grade have yet to appear on these children. It is best to error on the side of caution than to assume that performance at the low end of the normal range means the HELD and ELD children will continue to perform at this level. As children progress through school more of the information they are expected to learn is obtained through reading. Some of the ELD children had difficulty with Reading Recognition as evidenced in the large standard deviation. Reading difficulties were also seen in SELD children of the Scarborough and Dobrich study (1990). Follow-up studies on academic performance beyond second grade would be beneficial to determine if the HELD and ELD children were able to continue academic performance within the normal range as academic demands increase.

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Appendix A

Oregonian Article

Toddlers with delayed speech sought

A Portland State University researcher is looking for otherwise normal toddlers who begin talking late to serve as subjects in a study of delayed speech and its connection, if any, to later language problems.

Rhea Paul, a PSU assistant professor of speech communication, said the reasons for delayed speech in "late-blooming" young children and the early identification of toddlers who later will suffer chronic language delay had not been well-investigated, although perhaps 10 percent of American children may fall into those categories.

Paul is interested in studying children between the ages of 18 and 30 months in the Portland-Vancouver area who can say only five or fewer words, instead of the 50 or so most children can speak by that age. She

hopes to monitor their progress in speech development for two to five years, using such tools as speech tests and videotaped play sessions with their parents, to determine whether the children are indeed late-bloomers or whether their lack of early communication skills signals the start of severe speech and language delays.

Early identification of such children may allow early intervention and prevent future speech deficits, she said.

Paul's research is funded by the Fred Meyer Charitable Trust, the American Speech, Language and Hearing Foundation, and PSU. Parents who are interested in allowing their children to participate may contact Paul through the PSU Department of Speech.

The Oregonian, Portland, Oregon

Appendix B

Parent Permission Form

COLLEGE OF
LIBERAL ARTS AND SCIENCES

DEPARTMENT OF
SPEECH COMMUNICATION
SPEECH AND
HEARING SCIENCES



PORTLAND
STATE
UNIVERSITY
P.O. BOX 751
PORTLAND, OREGON
97207
503-229-3531

March 20, 1987

Dear Parents,

We are trying to learn more about the ways in which children develop an understanding of sentences, and compare the strategies normal children use with those used by children with disorders like mental retardation and autism. We would appreciate it greatly if you would allow your child to participate in our study, to be conducted at ECLC. Each child in the study will be taken from his/her classroom for 10-15 minutes and given a set of sentences to act out with toys (such as "Show me: the truck pushes the car.") Graduate students in speech-language pathology will conduct the testing under my supervision. Each child will receive a small gift for participating, and the school will receive a toy to thank the staff for their help. A brief summary of your child's performance on the task will be sent to you, for your information. Otherwise, all results will be kept strictly confidential.

Your cooperation in this study is completely voluntary and, if you decline to participate, the services your child receives at ECLC, Portland State University or anywhere else will not be affected in any way. If you choose to participate, you may withdraw at any time. While there will be no direct benefit to your child as a result of his/her participation, we think the results of the study will help us to understand better how normal children accomplish the task of learning language, and how children with disorders differ in their acquisition strategies.

If you would like to participate, please sign the statement below and return this letter to me in the enclosed envelope. If you have any questions at all please do not hesitate to call me at 229-3533. Thank you for your cooperation.

Yours,

A handwritten signature in cursive script that reads "Rhea Paul".

Rhea Paul, Ph.D.
Assistant Professor

I give my permission for my child _____
whose preschool teacher is _____
to participate in the study described above.
Child's birthdate: _____

Parent's Signature

Date

Appendix C

Questionnaire for Parent of Children 15-30 Mo.

QUESTIONNAIRE FOR PARENTS OF CHILDREN 15-30 MONTHS OLD

What is your child's:

first name? _____

date of birth? _____

Mother's (or primary parent's) full name? _____

Mother's (or primary parent's) phone number? _____

Mother's occupation _____

Father's occupation _____

How many different words can your child say? (It's OK if the words aren't entirely clear, as long as you can understand them).

none _____

10-30 _____

less than five _____

30-50 _____

5-10 _____

more than 50 _____

If your child says fewer than ten words, please list them

here:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Does your child put words together to form short "sentences"?

Yes _____ No _____

If yes, please give three examples here:

Would you be interested in participating in later parts of this study?

Yes _____ No _____

Appendix D

Language Development Survey

VOCABULARY CHECKLIST

<u>FOOD</u>	<u>ANIMALS</u>	<u>ACTIONS</u>	<u>HOUSEHOLD</u>	<u>PERSONAL</u>	<u>CLOTHES</u>	<u>MODIFIERS</u>	<u>OTHERS</u>
apple	bear	bath	bathrub	brush	belt	allgone	A, B, C, etc.
banana	bee	breakfast	bed	comb	bouts	all right	away
bread	bird	bring	blanket	glasses	coat	bad	booboo
butter	bug	catch	bottle	key	diaper	big	byebye
cake	bunny	clap	bowl	money	dress	black	curse words
candy	cat	close	chair	paper	gloves	blue	here
cereal	chicken	come	clock	pen	hat	broken	hi, hello
cheese	cow	cough	cnb	pencil	jacket	clean	in
coffee	dog	cut	cup	penny	mittens	cold	me
cookie	duck	dance	door	pocketbook	pajamas	dark	meow
crackers	elephant	dinner	floor	tissue	pants	dirty	my
drink	fish	doodoo	fork	toothbrush	shirt	down	myself
egg	frog	eat	glass	umbrella	shoes	good	nightnight
food	horse	feed	knife	watch	slippers	happy	no
grapes	monkey	finish	light		sneakers	heavy	off
gum	pig	fix	mirror	<u>PEOPLE</u>	socks	hot	on
hamburger	puppy	get	pillow	aunt	sweater	hungry	out
hot dog	snake	give	plate	baby		little	please
ice cream	tiger	go	potty	boy	<u>VEHICLES</u>	mine	Sesame St.
juice	turtle	have	radio	daddy	Dike	more	scuse me
meat		help	room	doctor	boat	open	shut up
milk		hit	stnk	girl	bus	pretty	thank you
orange	<u>BODY</u>	hug	soap	grandma	car	red	there
pizza	<u>PARTS</u>	jump	sofa	grandpa	motorbike	shut	under
pretzel	arm	kick	spoon	lady	plane	stinky	welcome
soda	belly	kiss	stairs	man	stroller	that	what
soup	bottom	knock	table	mommy	train	this	where
spaghetti	chin	look	telephone	own name	trolley	tired	why
tea	ear	love	towel	pet name	truck	up	woofwoof
toast	elbow	lunch	trash	uncle		wet	yes
water	eye	make	TV	Ernie, etc.		white	you
	face	nap	window			yellow	yummy
	finger	outside				yucky	1, 2, 3, etc.
<u>TOYS</u>	foot	pattycake					
ball	hair	peekaboo					
balloon	hand	peepee					
blocks	knee	push					
hook	leg	read					
hubble	mouth	rde					
crayons	neck	run					
doll	nose	see					
pretent	teeth	show					
slide	thumb	sing					
swing	toe	sit					
teddy bear	tummy	sleep					
		stop					
<u>OUTDOORS</u>	<u>PLACES</u>	take					
flower	church	take					
house	home	throw					
moon	hospital	tickle					
rain	library	walk					
sidewalk	McDonalds	want					
snow	park	wash					
star	school						
street	store						
sun	zoo						
tree							

Please list any other words your child uses here:

Does your child combine two or more words in phrases?

(e.g., more cookie, car byebye, etc.) yes _____ no _____

Please list below THREE of your child's longest and best sentences or phrases.

This survey instrument was developed by Leslie Rescorla, Ph.D.

APPENDIX
LANGUAGE DEVELOPMENT SURVEY

Dear Parent,

We are engaged in research on expressive language development in 2-year-old children. We are especially interested in learning more about children who are slow in talking. We invite you to help us by completing this form and the vocabulary checklist on the back. Participation is entirely voluntary and all information given will be strictly confidential.

Thank you,
Leslie Rescorla, Ph.D.

Date _____ Your name _____ Child's name _____ Birthdate _____ Sex _____ Age _____ Mother's name _____ Address _____ _____ Telephone _____ Date of birth _____ Marital status _____ Level of education completed _____ _____ Employment: Not employed _____ Employed part-time _____ Employed full-time _____ Occupation _____ Please give age and sex of other children in family _____ Has anyone in your family been slow in learning to talk? _____ If so, who? _____ Was your child premature? _____ How many weeks early? _____ How many ear infections has your child had? _____ Is child in daycare or cared for regularly by babysitter? _____ If so, how many hours per week? _____ What language is spoken in your home? _____ Please list languages spoken if other than English _____ Are you worried about your child's language development? _____	Father's name _____ Address _____ _____ Telephone _____ Date of birth _____ Marital status _____ Level of education completed _____ _____ Employment: Not employed _____ Employed part-time _____ Employed full-time _____ Occupation _____
---	---

PLEASE COMPLETE VOCABULARY CHECKLIST ON THE REVERSE SIDE.

Please check off each word your child says. Don't include words your child can understand but not say. It's all right to count words that aren't pronounced clearly. Don't count words which your child repeats after you in imitation but does not say spontaneously.

Appendix E

Developmental Sentence Score Criteria

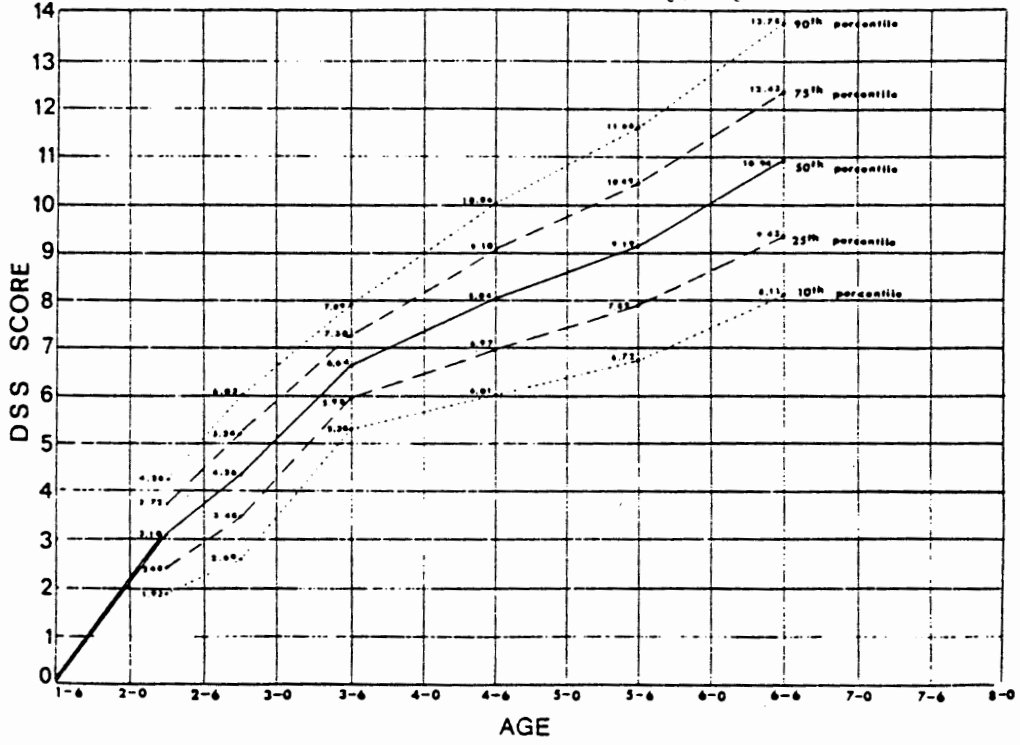
SCORE	INDEFINITE PRONOUNS OR NOUN MODIFIERS	PERSONAL PRONOUNS	MAIN VERBS	SECONDARY VERBS	NEGATIVES	CONJUNCTIONS	INTERROGATIVE REVERSALS	WH QUESTIONS
1	it, this, that	1st and 2nd person: I, me, my, mine, you, your(s)	A. Uninflected verb: I see you. B. copula, it or 's': It's red. C. is + verb + ing: He is coming.		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? Weren't they there?	
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 infinitives: I wanna see (want to see) I'm gonna see (going to see) I gotta see (got to see) I gotta [to] see (let me [to] see) Let's [to] play (let [us to] play)				A. who, what, what + noun Who ain't? What is he eating? What food 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 hamster for?
3	A. no, some, more, all, lots, 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 fool. It's hard to do that.		and		
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.	can't, don't		Reversal of auxiliary be: Is he coming? Isn't he coming? Was he going? Wasn't he going?	
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.	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?

SCORE	INDEFINITE PRONOUNS OR NOUN MODIFIERS	PERSONAL PRONOUNS	MAIN VERBS	SECONDARY VERBS	NEGATIVES	CONJUNCTIONS	INTERROGATIVE REVERSALS	WH QUESTIONS
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/whom to take	A. could, would, should, might + verb: <i>might come, could be</i> B. Obligatory does, did + verb C. Emphatic does, did + verb			because	A. Obligatory do, does, did: <i>Do they run? Does it bite? Didn't it hurt?</i> B. Reversal of modal: <i>Can you play? Won't it hurt? Shall I sit down?</i> C. Tag question: <i>It's fun, isn't it? It isn't fun, is it?</i>	
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: <i>must come</i> C. have + verb + en: <i>I've eaten</i> D. have got, I've got it.	Passive infinitival complement: With get: <i>I have to get dressed.</i> I don't want to get hurt. With be: <i>I want to be pulled.</i> It's going to be locked.	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 <i>Why are you crying?</i> <i>What if I won't do it?</i> <i>How come he is crying?</i> <i>How about coming with me?</i>
8			A. have been + verb + ing had been + verb + ing B. modal + have + verb + en, <i>may have eaten</i> C. modal + be + verb + ing: <i>could be playing</i> D. Other auxiliary combinations: <i>should have been sleeping</i>	Gerund: <i>Swimming is fun.</i> I like fishin . He started laughing .		A. where, when, how, while, whether (or not), till, until, unless, since, before, after, for, as, as + adjective + as, as if, like, that, than I know where you are. Don't come til I call. B. Obligatory deletions: I run faster than you [run]. I'm as big as a man [is big]. [I look like a dog [look]]. 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: <i>Has he seen you?</i> B. Reversal with two or three auxiliaries: <i>Has he been eating? Couldn't he have waited? Could he have been crying? Wouldn't he have been going?</i>	whose, which, which + noun <i>Whose cat is that?</i> <i>Which book do you want?</i>

Appendix F

Developmental Sentence Score Norms

Figure 1. Norms for Developmental Sentence Scoring (Reweighted)



Appendix G

Human Subjects Research Approval (G1 & G2)

*HUMAN SUBJECTS RESEARCH
REVIEW COMMITTEE*

MEMORANDUM

OFFICE OF GRANTS AND CONTRACTS

DATE: May 24, 1991
TO: Rhea Paul, SP
FROM: Joan Shireman, Chair, HSRRC *JSP*
RE: Your students' thesis/dissertation projects

With regard to your graduate students working with data from your research project entitled "Predicting Outcomes of Early Expressive Language Delay", application for Human Subjects Research Review may be unnecessary due to their procedures which involve the use of secondary data. However, if human subjects can be identified as data is handled, the Committee will need to review procedures for risk as there may be some in some studies.

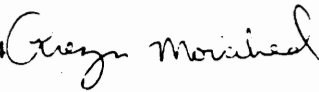
If you have questions, please call me at X5-5005. Thank you.

c. Office of Grants and Contracts

OFFICE OF RESEARCH AND SPONSORED PROJECTS

DATE: April 29, 1994

TO: Kathleen A. Clancy

FROM: for Martha Balshem, Chair, HSRRC, 1993-94 

RE: HSRRC Waived Review of Your Application titled "Second Grade Academic Performance in Normal, Late Talking & History of Late Talking Children"

Your proposal is exempt from further HSRRC review, and you may proceed with the study.

Even with the exemption above, it was necessary by University policy for you to notify this Committee of the proposed research and we appreciate your timely attention to this matter. If you make changes in your research protocol, the Committee must be notified.

c. Office of Graduate Studies

Appendix H

Raw data

Subject Personal Information

<u>Subject #</u>	<u>Age a</u>	<u>Sex</u>	<u>SES b</u>	<u>Ethnicity c</u>
Normal Group				
004	94	M	3	O
009	93	M	3	O
014	98	M	1	W
027	99	M	4	B
036	98	F	1	W
040	96	F	4	W
051	93	F	4	W
055	97	F	3	W
058	102	M	1	W
059	102	F	1	W
063	97	F	1	W
072	95	F	4	W
081	97	F	5	W
095	96	M	3	W
113	94	F	3	W
126	96	F	1	W
128	99	M	2	W
129	96	M	5	W
130	95	M	3	W
131	97	M	2	W
132	97	M	1	O
133	91	M	4	W
138	100	M	4	W
139	96	F	2	W
141	95	M	1	W
144	96	M	1	W
150	95	F	1	W

a Age given in months.

b Based on a two factor index based on Myers and Bean (1968), where 1 is the highest and 5 is the lowest SES rating.

c. W= white B= black O= other

<u>Subject #</u>	<u>Age a</u>	<u>Sex</u>	<u>SES b</u>	<u>Ethnicity c</u>
HELD Group				
006	96	M	2	W
007	96	M	2	W
012	95	M	2	W
029	98	F	5	W
039	94	M	2	W
041	93	M	2	W
057	94	F	4	W
084	92	M	2	W
085	95	M	3	W
086	98	M	2	W
087	95	M	3	W
090	103	M	3	W
091	99	M	3	W
092	94	M	3	W
094	99	M	3	W
098	98	M	2	W
100	96	M	2	W
102	98	M	1	W
103	94	M	2	W
105	95	M	4	W
107	100	F	2	W
109	92	M	2	W
111	95	F	3	W
114	99	M	2	O
119	101	M	2	W
122	92	F	2	B
142	96	F	1	W

a Age given in months.

b Based on a two factor index based on Myers and Bean (1968), where 1 is the highest and 5 is the lowest SES rating.

c. W= white B= black O= other

<u>Subject #</u>	<u>Age a</u>	<u>Sex</u>	<u>SES b</u>	<u>Ethnicity c</u>
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ELD Group

015	96	M	3	W
019	95	M	3	W
093	95	M	3	W
097	98	M	3	W
101	95	M	4	W

a Age given in months.

b Based on a two factor index based on Myers and Bean (1968), where 1 is the highest and 5 is the lowest SES rating.

c. W= white B= black O= other

Individual DSS Scores

<u>Subject #</u>	<u>DSS score</u>
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Normal Group

004	10.02
009	12.06
014	8.16
027	8.88
036	8.20
040	8.82
051	11.08
055	10.66
058	13.24
059	10.04
063	11.88
072	10.00
081	8.98
095	9.46
113	9.14
126	11.04
128	8.68
129	8.18
130	15.74
131	10.46
132	11.31
133	10.04
138	11.46
139	14.82
141	11.04
144	10.46
150	10.70

<u>Subject #</u>	<u>DSS score</u>
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HELD Group

006	10.98
007	10.27
012	8.52
029	9.40
039	11.22
041	9.56
057	9.94
084	10.06
085	10.08
086	8.22
087	8.66
090	13.98
091	8.60
092	12.24
094	9.88
098	8.84
100	11.96
102	9.84
103	10.54
105	10.24
107	9.90
109	9.14
111	9.84
114	12.04
119	10.14
122	9.46
142	9.32

<u>Subject #</u>	<u>DSS score</u>
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ELD Group

015	6.84
019	6.91
093	6.84
097	6.96
101	7.68

Individual PIAT Subtest Scores

<u>Subject #</u>	<u>M</u>	<u>RR</u>	<u>RC</u>	<u>SP</u>	<u>GI</u>	<u>Total*</u>
Normal Group						
004	100	78	86	81	92	86
009	99	80	87	96	92	89
014	105	88	94	84	101	94
027	135	115	116	113	131	125
036	110	123	131	105	118	121
040	119	119	117	110	116	119
051	96	102	107	95	114	105
055	113	112	113	106	115	114
058	113	111	114	100	118	115
059	112	111	107	107	121	115
063	116	135	126	119	135	135
072	100	107	102	103	98	100
081	109	112	120	107	118	117
095	115	111	102	103	98	107
113	106	115	114	105	118	114
126	109	128	123	125	120	126
128	122	120	128	113	116	122
129	107	119	108	111	116	114
130	97	135	125	106	128	123
131	117	117	114	110	101	114
132	135	123	118	125	135	135
133	99	122	114	105	116	114
138	119	109	109	99	112	112
139	125	>135	135	>135	131	>135
141	>135	109	112	98	112	114
144	116	119	120	110	135	123
150	125	135	135	116	131	135

Note* M= Math, RR= Reading Recognition, RC= Reading Comprehension, SP= Spelling, GI= General Information, Total= Total Test Score.

<u>Subject #</u>	<u>M</u>	<u>RR</u>	<u>RC</u>	<u>SP</u>	<u>GI</u>	<u>Total*</u>
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HELD Group

006	100	128	108	122	111	115
007	119	88	99	105	113	108
012	102	111	105	118	111	112
029	98	88	94	92	84	91
039	120	135	108	118	113	120
041	121	118	120	108	118	119
057	89	106	103	88	95	95
084	128	125	118	131	119	128
085	103	102	87	87	84	91
086	112	105	<65	110	126	113
087	126	95	110	105	128	116
090	131	131	128	126	118	131
091	107	87	101	88	90	96
092	115	119	116	118	112	118
094	102	117	114	99	92	112
098	113	128	120	122	122	126
100	126	106	109	111	103	112
102	105	92	98	100	103	98
103	115	119	110	105	121	117
105	126	128	121	108	113	122
107	115	135	126	114	121	128
109	122	115	113	105	126	118
111	105	122	112	120	112	117
114	90	86	88	92	122	100
119	108	135	135	125	135	135
122	91	83	98	100	95	92
142	115	128	113	112	118	118

Note* M= Math, RR= Reading Recognition, RC= Reading Comprehension, SP= Spelling, GI= General Information, Total= Total Test Score.

<u>Subject #</u>	<u>M</u>	<u>RR</u>	<u>RC</u>	<u>SP</u>	<u>GI</u>	<u>Total*</u>
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ELD Group

015	84	95	110	103	92	96
019	84	74	83	80	92	80
093	93	123	109	126	95	112
097	96	84	99	92	107	95
101	112	119	109	128	117	116

Note* M= Math, RR= Reading Recognition, RC= Reading Comprehension, SP= Spelling, GI= General Information, Total= Total Test Score.