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Story retelling skills in 4-year-olds with histories of normal and delayed language development

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AN ABSTRACT OF THE THESIS OF Rita Louise Smith for the Master of Science in Speech Communication with an emphasis in Speech-Language Pathology presented April 29, 1991.

Title: Story Retelling Skills in 4-Year-Olds With Histories of Normal and Delayed Language Development

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

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There is a growing group of researchers who believe that narrative skills are the bridge from oral language to literacy (Culatta, Page, & Ellis, 1983; Roth & Spekman, 1989; Westby, 1989). Narrative production requires higher level language skills to create a cohesive discourse unit using decontextualized language. Narrative ability has also been found to be the best predictor for normal speech and language development for preschoolers with language

impairments (Bishop & Edmundson, 1987) and reading comprehension achievement for learning-disabled, school-age children (Feagans & Applebaum, 1986). These same skills are prerequisites for achievement of literacy and school success.

The purpose of the present study was to compare the story retelling ability of 4-year-olds who did not achieve normal expressive language milestones at age 2 with those who did. The original group size was 22 children with normal expressive vocabulary size at age 24-34 months, and 23 children whose expressive vocabulary size fell below the normal range at 24-34 months referred to as "late talkers."

These two groups of children were re-examined at age 4. Each child was audiotaped while producing a narrative and a spontaneous language sample. The Bus Story (Renfrew, 1977), a story retelling procedure, was administered for the narrative measure.

When the spontaneous language samples were scored for syntactic complexity with Lee's (1974) Developmental Sentence Score, 10 (43%) of the original "late talking" group had scores in the normal range and were reclassified as having a history of language delay. The remaining 13 (57%) who continued to fall below the normal range were now classified as having a chronic language delay.

The narrations produced by all of the children were scored on seven measures: information retold, sequence retold, adequacy of cohesion used, mean length per utterance

unit (T-unit) in morphemes, number of different word roots produced, narration length in T-units, and percentage of new propositions produced. The following questions were addressed:

1. Are the story retelling skills of children with a history of language delay more like their normally achieving peers or their peers with chronic language deficits?
2. Can expressive language performance at age 2 be used to predict performance on a story retelling task at age 4?

The data were analyzed to see if significant differences existed between the language diagnostic groups. On the measures where an ANOVA test found a significant F value ($F > 3.23$, $p < .05$), a Tukey Multiple Comparison Test was done to determine where the significant differences among the groups existed.

No significant differences were found between the history of delay group and the normal group on any measures. Significant differences between the history of delay group and the chronic delay group were found on two measures—sequence and mean length in morphemes of the T-units produced in the story retelling task. Significant differences were found between the normal group and the chronic delay group on every measure of the narration task except for length of narration in T-units.

The history of delay group appears to have "caught up" to their normal peers on measures of sequential event retelling and morpheme production in utterance units.

On every other measure of the narrations produced, the history of delay group's performance fell in the middle, with no statistically significant differences found between the history of delay group and the normal group, or between the history of delay group and the chronic delay group. It is not clear whether the history of delay group may have ongoing deficits that were not measured by this study, or whether the skills of the history of delay group have improved to a normal range but are not high enough to distinguish themselves from the chronic delay group.

STORY RETELLING SKILLS IN 4-YEAR-OLDS
WITH HISTORIES OF NORMAL AND DELAYED LANGUAGE DEVELOPMENT

by
RITA LOUISE SMITH

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

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TABLE OF CONTENTS

	PAGE
LIST OF TABLES	vi
CHAPTER	
I INTRODUCTION ,	1
Statement of Purpose	3
Definition of Terms	5
II REVIEW OF THE LITERATURE	8
Narratives	8
Story Grammar	9
Narrative Development	9
Relationship Between Narrative Skills and Academic Success	12
Story Retelling	14
Literature Regarding <u>The Bus</u> <u>Story</u>	
Role of Comprehension in Recall Tasks	16
Role of Narrative Analysis in Describing Language Skills . . .	18
III METHODS AND PROCEDURES	20
Subjects	20
Recruitment Group Assignment at Age 2 Group Assignment at Age 4	

Procedures	23
Experimental Procedures	
Instrumentation	26
Coding and Analysis of Narrative Samples	27
Transcription	
Information Score	
T-Unit Segmentation	
Sequence Score	
Cohesion Adequacy	
Word Roots	
New Propositions	
Research Design	
Statistics	
Reliability	
IV RESULTS AND DISCUSSION	33
Results	33
<u>"The Bus Story</u> Information Score"	
Sequence Score	
The Cohesion Adequacy Score	
Mean Length of T-Units	
Total Number of Word Roots Produced	
Length of Story in T-Units	
Percentage of New Propositions Produced	
Discussion	40
V SUMMARY AND IMPLICATIONS	43
Summary	43
Implications	46
Research	
Clinical	
REFERENCES	50

APPENDICES

A	QUESTIONNAIRE FOR PARENTS OF CHILDREN 15-30 MONTHS OLD	54
B	<u>OREGONIAN</u> ARTICLE	56
C	PARENT PERMISSION FORM	58
D	LANGUAGE DEVELOPMENT SURVEY	60
E	<u>THE BUS STORY</u> : PICTURES AND TEXT	62
F	DEVELOPMENT SENTENCE SCORE: SCORING CRITERIA	65
G	DEVELOPMENT SENTENCE SCORE: NORMS	68
H	<u>THE BUS STORY</u> : INFORMATION SCORE CRITERIA	70
I	<u>THE BUS STORY</u> : SEQUENCE SCORE	72
J	COHESION SCORING PROCEDURE	75

LIST OF TABLES

TABLE		PAGE
I	Group Description	24
II	Range, Mean, and Standard Deviation of Each Group for Each of the Dependent Measures	34
III	ANOVA and Tukey Test Results	36

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CHAPTER I

INTRODUCTION

Children's language learning increases dramatically in the preschool years. As children begin comprehending and producing longer units of meaning, the foundation is laid for higher level language abilities. Higher level language processing depends upon the child's ability to integrate and organize units of meaning beyond the sentence level. Larger units of meaning, for example, a fairy tale, a story, and a sequence of events, are not defined by length, but by unity. The skill of comprehending and producing larger units of meaning is a discourse level skill, and in recent years narrative skill, one type of discourse, has become of increasing interest to researchers and clinicians in the speech-language pathology field.

Research indicates that narrative skills are important for reading comprehension and school success (Feagans & Applebaum, 1986; Feagans & Short, 1984). Given that the narrative mode is often used in the classroom environment, both orally and in written text, this finding is not surprising. Although narrative skills of normally developing preschoolers have been studied (Applebee, 1978; Botvin & Sutton-Smith, 1977; John, Horner, & Berney, 1970),

little information on narrative skills of preschoolers with delayed-language skills is available.

About 15% of otherwise normal middle-class toddlers fail to achieve standard language milestones such as production of 50 words and use of two-word combinations by 24 months (Rescorla, 1989). Little is known about the prognosis for these "late talkers." Examining the outcome at age 4 in terms of a variety of productive language abilities will help determine whether or not these children outgrow their delay.

Narrative development of school-age children, both normally achieving and learning or language delayed, has been studied, and significant differences in production of story recalls have been found between groups (Feagans & Applebaum, 1986; Feagans & Short, 1984; Griffin, Ripich, & Dastoli, 1986; Levi, Musatti, Piredda, & Sechi, 1984).

In this study, narratives produced on a story retelling task were examined. In order to quantify retelling skill, several variables were chosen to index story retelling. These variables were thought to survey a range of abilities necessary to produce comprehensible stories. Some variables were chosen from the literature on narrative development and some were devised for the purpose of this study (see Chapter III). These include:

1. Information, a score indicating the number of units of information retold from a narrative which indexes

and taxes the child's expressive semantic skill (Renfrew, 1977).

2. Sequence, a score corresponding to the accuracy with which the story's sequential events are retold.

3. Use of appropriate cohesive ties between elements in a story (which requires explicit linguistic marking and is known to be problematic for older language learning-disabled children) (Liles, 1987).

4. Mean length of utterance unit in morphemes, a commonly used measure of syntactic development.

5. Number of word roots, a measure of lexical diversity which reflects the richness of vocabulary in use by the narrator.

6. Narration length, a measure of the quantity of utterance units produced and an aspect of narrative development which increases with age.

7. New propositions, the number of original idea units produced which, when compared with the story length, denotes what percentage of the utterance units are encoding new ideas and how many repetitions or redundancies were used by the narrator.

STATEMENT OF PURPOSE

The purpose of this study was to examine the narrative skills of 4-year-old children with a history of "late talking." The following groups of children (for criteria see Chapter III) will be compared:

1. Normally developing.

2. Those who did not achieve language milestones at age 2, but did fall in the normal range as measured by the Developmental Sentence Score (DSS) (Lee, 1974) at age 4 (history of delay group).

3. Those who failed to achieve language milestones at age 2 and who continue to fall below the 10th percentile for their age group at age 4 (chronic delay group) as measured by the DSS (Lee, 1974).

The specific objective of this study was to determine whether there are differences in story retelling ability in 4-year-old children that can be related to language characteristics at age 2. Performance on a story retelling task, The Bus Story (Renfrew, 1977) was examined to determine if significant differences existed between the groups. The questions of interest in this study included:

1. Are the narrative skills of children with a history of language delay more like their normally achieving peers or their peers with chronic language deficits?

2. Is expressive language performance at age 2 related to performance on a story retelling task at age 4?

The research hypothesis for this study was: On a story retelling task, story retelling skills of children with a history of language delay will be significantly different from their normally developing peers on each of the seven variables examined: information score, sequence score, percentage of complete cohesion used, mean length of

T-unit in morphemes, word root total, story length, and percentage of new propositions used.

The null hypothesis for this study was: Looking at three language diagnostic groups of 4-year-old children, no significant differences will be found between the groups' story retelling skills as measured by the scoring of information units produced, sequence retold, percentage of complete cohesion used, mean length of T-units in morphemes, number of word roots used, total number of T-units produced, and percentage of new propositions encoded on a story retelling task.

DEFINITION OF TERMS

For the purpose of this study, the following definitions will be used:

1. Cohesion: Use of grammatical structures which contribute to the continuity of a text when referring to redundant information. Cohesion is expressed through five linguistic forms:

a. Reference, either personal (*he, mine, it, one*) or demonstrative (*this, that, then*), referring to a precise referent (Halliday & Hasan, 1976).

b. Substitution, an element such as *one*, which refers to a category rather than a precise referent.

c. Ellipsis, when unstated information is understood from the utterance preceding or following,

as in: "The policeman told him to stop. But he didn't."

d. Conjunction, which ties the information together by use of additive conjunctions (e.g., *and*), adversative conjunctions (e.g., *but*, *though*); causal conjunctions (e.g., *because*), or temporal conjunctions (e.g., *then*).

e. Lexical cohesion, when a word is identified with a different word mentioned previously in the text, as in: "The bus raced down the *hill*. As soon as he saw there was water at the *bottom*, he tried to stop" (Halliday & Hasan, 1976).

2. Discourse: Connected language in a context.

3. History of language delay: Those children who were classified as late talkers at 24-34 months and at age 4 scored at the 10th percentile or higher on a language sample using the DSS (Lee, 1974).

4. Information score: Total points earned on The Bus Story retelling task using Renfrew's (1977) criteria. Two points are earned for each main item retold, one point for each subordinate item.

5. Late talker: Children who produce less than 50 words or no two-word combinations (by parent report) at age 24 months or older.

6. Morpheme: The smallest unit in meaning of language.

7. Narrative: A type of text discourse recounting a sequence of events with a focus on people, animals, or objects that have taken on human characteristics, a story (Scott, 1988a).

8. Normal language history: When production of 50 words and two-word combinations (by parent report) is achieved by 24 months of age.

9. Proposition: A basic unit of meaning which expresses a complete idea.

10. Sequence: A particular order of events.

11. T-unit (minimal terminable units): A term proposed by Hunt (1965) as a means of segmenting written or spoken discourse according to its grammatical structure. "The T-unit consists of a main clause with all subordinate or nonclausal structures attached to or embedded within" (Scott, 1988b, p. 55).

12. Text: A general term used to describe any oral or written unit of language beyond the sentence level that forms a meaningful and unified whole (Halliday & Hasan, 1976).

CHAPTER II

REVIEW OF THE LITERATURE

NARRATIVES

As the language abilities of children develop, the unit used to encode meaning grows from a single word, to a phrase, to a sentence, to a group of sentences that form a meaningful whole. This larger unit of meaning is called text. Rather than being defined by length, the text unit is defined by the organization of meaning extending beyond the sentence level (Halliday & Hasan, 1976; Liles, 1987).

One type of text discourse is called narratives. The features that distinguish narratives from other forms of discourse are: (a) the focus is on people, animals, or objects that have taken on human characteristics, and (b) the events are sequential (Scott, 1988a). Like conversation, narration demands that the speaker have a purpose and present clear and relevant information. Unlike conversation, narration is a monologue that requires an introduction, organized sequence, problem, and resolution (Roth & Spekman, 1989).

STORY GRAMMAR

Narratives are thought to be organized around a structure or set of rules called a story grammar. An individual's knowledge of story grammar expands through exposure to a variety of stories. Knowledge about story grammar is used both in comprehension and production of narratives. It is believed that an individual both remembers and produces narratives by breaking up the larger unit into its component parts (Stein & Glenn, 1982). Like any complex cognitive process, it is through imposing a structure that the individual is able to organize and handle complexity (Applebee, 1978).

Skills involved in production of narratives involve receptive and expressive language skills and a structure or schema for both understanding and producing the narrative. The narrative ability of individuals thus provides insights into their capability in a complex of areas including how they encode and convey information and their proficiency in producing language at a discourse level (Milosky, 1987).

NARRATIVE DEVELOPMENT

Growth of narrative ability follows a developmental course. Children may begin expressing ideas for the purpose of narration as young as age 2, but it may not be until adolescence that a child can tell a story that is both sequentially accurate and tied together cohesively.

Research shows that as age increases, narratives increase in number of words, T-units, words per T-unit, characters, incidents expressed, complexity, and cohesion (Applebee, 1978; Halliday & Hasan, 1976; Lahey, 1988).

Applebee (1978) has proposed stages of story development. Through his research of normally developing preschoolers aged 2 to 5, Applebee proposes six basic types of story structure which parallel Vygotsky's (1962) stages in concept development both in structure and developmental order. The first two stages are considered "prenarrative."

1. In a "Heap Story," the child simply labels or describes activities of whatever has captured his or her attention. There are few, if any, links between sentences. This is considered the most primitive narrative structure, and is used by some (less than 20%) 2-year-olds (Applebee, 1978).

2. "Sequences" is a story of associations between a central setting or character and activities. The associations are only that of similarities, rather than causality or a temporal sequence. Applebee (1978) found this to be the most frequently occurring narrative structure among 2-year-olds.

3. "Primitive Narratives" are organized around a central character or object. The story's form is a description of characteristics or events that are associated with the central core. Applebee (1978) found about 20% of

the narratives of 2- and 3-year-olds and 10% of the narratives of 4-year-olds to be organized in this way.

4. "Unfocused Chain," although not found frequently (less than 20% of 5-year-olds), is an example of early use of chaining. This structure consists of a series of incidents, one leading to the next, but no central core which ties the incidents together. The child links the events together, but the story lacks a structured whole (Applebee, 1978).

5. "Focused Chain" has a central core around which a series of situations is organized. The main character goes through a series of events that are linked to one another. This structure was employed by over half of the 4- and 5-year-olds Applebee (1978) studied.

6. "True Narrative" extends the focused chain by including motivation of the central character. This structure begins to emerge at age 5 (Applebee, 1978).

Using Applebee's (1978) model of development for narrative skills, one can predict the types of narratives that will be produced on a story retelling task with visual cues. The child using the heap story structure will not recognize the characters on each page as the same, and therefore will not create a story with a main character as a core. The sentences produced will not relate to one another, and no cohesion techniques will be used. For the child employing the sequence structure, the activities of a central character will be described, but these activities

will not be related to each other in a time sequence or cause/effect sequence. The narrative will be built upon the central character, rather than causal or temporal factors. The child using the primitive narrative structure will describe the activities and may use cohesion to link them. A child telling a story using an unfocused chain structure would tell each event as an outgrowth of the previous one with no central core to the story. If Applebee's results are repeated, one would expect many of the stories to have a focused chain structure with a main character experiencing a series of events. A child who uses the true narrative structure would tell a story with a central focus which ties the events together through either concrete or abstract bonds.

Applebee (1978) found that children's narratives do not fit neatly into one stage or another, but rather may show aspects of different stages of organization in different parts of the narrative. In his study of children's narratives, he assigned a stage according to the dominant mode of organizational structure used.

RELATIONSHIP BETWEEN NARRATIVE SKILLS AND ACADEMIC SUCCESS

There is a growing group of researchers who believe that narrative skills are the bridge from oral language to literacy (Culatta, Page, & Ellis, 1983; Roth & Spekman,

1989; Westby, 1989). Research indicates the ability to narrate stories increases with age until approximately age 10 (Liles, 1985). Event recall, temporal sequencing of events, and cohesion of event sequences are necessary to successfully narrate or retell a story.

Bishop and Edmundson (1987) did a longitudinal study in search of indicators of normal outcome for 4-year-olds with language impairments. They concluded that good prognosis for normal speech and language was closely related to good expressive semantic ability at age 4 as measured by retelling a story with sequential events.

Feagans and Applebaum (1986) examined academic outcomes of learning disabled children over a three year period. They concluded that those children with better narrative skills (as measured by a story paraphrase or retelling) relative to syntactic and semantic skills were more successful academically than those learning disabled children with high syntactic and semantic scores and poor narrative scores. They conclude that "the ability to understand and paraphrase narratives appears to be a critically important skill for academic functioning for learning disabled children" (p. 364).

Norris and Bruning (1988) found significant differences between low achieving and high-achieving kindergarten and first graders in the use of cohesion on a story retelling task. The authors found that high achievers are more accurate in their use of decontextualized language

and were more successful in establishing relationships among characters and events. Norris and Bruning suggest that cohesion use can be a useful descriptive measure when examining language abilities.

STORY RETELLING

A story retelling task, in which the examiner tells a story while showing pictures and then asks the child to retell the story, is one way to elicit a narrative from a child. Story retelling is an easier task for the child than "making up" a story. The idea is provided by the story told by the examiner, and the organization of the story is provided by the pictures. What is required of the child is to encode linguistically the ideas that are being cued visually by the pictures. It is believed the encoding of phrases not based on the pictures is a more demanding task cognitively (John et al., 1970).

Culatta et al. (1983), in their research on story retelling, believe a child's ability to integrate communicative performance can be measured by a story retelling task. They say the demands of this task require semantic decoding abilities, retention of verbally presented information, and organizing and sequencing content.

Merritt and Liles (1989) investigated the differences between original story generation and story retelling tasks.

They concluded that the story retelling task is more clinically useful because: (a) scoring is easier and therefore more reliable when a model for story comparison is available, and (b) there is decreased confusion when referent errors or word retrieval errors are made. They also found that the retold stories were longer and contained more complete episodes and other story grammar components than the generated stories for both language-impaired and language normal children. The longer stories give a better assessment of use of cohesion and syntax. Although longer, the retold stories were faster to transcribe and score than the generated stories, again because the story content was known (Merritt & Liles, 1989).

Literature Regarding The Bus Story

The Bus Story, developed by Renfrew (1977), is a story-retelling instrument which was standardized in England on 265 children from 3 to 8 years of age. These school children represented the same proportional range of intelligence as that found in the general population of England.

A longitudinal study by Bishop and Edmundson (1987) investigated the question of how to determine accurate prognoses for language-impaired preschoolers to develop normal language. The authors found that language development outcome could be predicted with 90% accuracy based on the battery test scores obtained at age 4. The Bus

Story (Renfrew, 1977) was found to be the most accurate prognostic tool, correctly predicting the outcome for 83% of the children.

There is a growing body of literature which indicates that a story retelling task does reflect a child's ability to integrate various language processes necessary for higher order language learning and literacy.

ROLE OF COMPREHENSION IN RECALL TASKS

The role of comprehension in a story recall task has been addressed by Omanson, Warren, and Trabasso (1978) whose research demonstrates that one cannot infer that the story told on a recall task represents what the child understands of a story. Comparing recall of 5-year-olds and 8-year-olds under two conditions—free recall and probed recall—comprehension as measured by inference probes was increased when motivational and setting information were provided. The authors expected more information would be given in free recall under those conditions that produced greater numbers and quality of inferences. However, free recall of story propositions did not increase. The authors conclude that one cannot measure a child's comprehension of a story by the number of events recalled immediately following listening to the story.

Peterson and McCabe (1983) support this finding of Omanson et al. (1978) and refer to doctoral research by

Evans (1980, cited by Peterson & McCabe, 1983) who found that children know much more information than they tell. Evans found that children can provide specific information in response to probes that they otherwise leave out. Peterson and McCabe also found in their collection of narratives from over 300 children that information provided in probed recall surpasses that in free recall, and one cannot infer that the story told in free recall represents what the child remembers of the story.

Thus, when children listen to a story and then retell it, one cannot assume their retold story is based on either what they remember or what they understood of the original story. The research cited above demonstrates that children know more information than they include in their retold stories. Factors beyond memory and comprehension come into play in the retelling process.

Merritt and Liles (1989) found that in a story retelling task, both language-impaired and nonimpaired elementary school students remembered details of the story equally well. A previous study by the same authors (Merritt & Liles, 1987) also presents evidence that language-impaired and nonimpaired children have similar abilities to recall details of a story presented orally. Thus, the role of memory in a retelling task cannot be claimed as a critical element in distinguishing the story production of language-impaired children versus their nonimpaired peers.

ROLE OF NARRATIVE ANALYSIS IN ASSESSING LANGUAGE SKILLS

Narrative analysis has become of increasing importance in describing language skills of mild and moderately language-impaired, school-age children. These disorders may not be apparent in language production at the word or sentence level, which is the level at which most standardized assessment instruments test (Chappell, 1980; Liles, 1985, 1987; Scott, 1988a). A narrative task includes demands similar to what a child experiences in an educational setting: using language to encode meaning in an organized way at the text level (Feagans & Applebaum, 1986; Garnett, 1986).

Research indicates a relationship exists between narrative skills and academic success, yet little is known about narrative development among preschoolers with language deficiencies or about their prognosis for academic success. Identifying children at an earlier age who are likely to be academically at risk would be helpful in providing appropriate early intervention.

This study provides descriptive information about narrative skills of children at age 4 who did not achieve the expected language milestones at age 2. Differences in story retelling abilities that can be related to language characteristics at age 2 may be useful in making diagnostic

and prognostic decisions for young children with slow expressive language development.

CHAPTER III

METHODS AND PROCEDURES

SUBJECTS

A total of 45 children participated in this study and were first recruited at the age of 20 to 34 months.

Recruitment

Subjects included in this study were recruited at approximately age 2 for the Portland Language Development Project, a longitudinal study of the characteristics of late talkers. A questionnaire (Appendix A) asking information about toddlers' expressive vocabulary size and willingness to participate in a language development study was distributed to parents who were recruited as described in #1 (below), or was filled out with information obtained over the telephone for parents recruited as described in #2 or #3:

1. Three medical clinics in the Portland metropolitan area distributed questionnaires over a 5-month period. These questionnaires were given to parents with children ranging from 16 to 24 months of age using the clinics for well-baby checks.

2. Parents responded to an article about the study in The Oregonian, a local newspaper, which requested speech-delayed toddlers to participate (see Appendix B).

3. Parents responded to a request for speech-delayed toddlers to participate in a research project. This request was broadcast on a local radio station.

Group Assignment at Age 2

Children 24- to 34-months-old were included in the late talkers group if their parents reported fewer than 50 words in their expressive vocabulary or no two-word combinations. Twenty-three children qualified for this group.

Subjects whose reported expressive vocabularies exceeded 50 words and who used two-word combinations at 24 to 34 months of age were included in the normal group. Twenty-two children fit the criterion for classification as normal in expressive language development.

At an initial assessment done at Portland State University, parents of the subjects signed a permission form for participation in the study (Appendix C). The Language Development Survey (LDS) (Rescorla, 1989), a vocabulary checklist, was also completed by parents at this time (see Appendix D). Initial group assignments were confirmed with the information obtained on the LDS. In order to be included in the late talking group, children had to continue to meet the original criteria in terms of reported number of

words in their expressive vocabulary and combinations of words spoken.

Additional criteria met by the subjects in order to be included in the study included: no known physical, mental or other disability which might affect normal language development; scoring in the normal range on the Bayley Scales of Infant Development (Bayley, 1969); and passing a hearing screening to verify hearing acuity at 25 dB or better. The groups were matched for age, sex ratio, and socio-economic status.

Group Assignment at Age 4

The 45 children in this study were seen individually at age 4. At this evaluation, first The Bus Story (Renfrew, 1977) (see Appendix E) was administered and then a spontaneous speech sample was collected from each subject while engaged in free play with their mother. The language sample's sole purpose was to determine which "late talkers" continued to be delayed in expressive language.

Each subject's language sample was scored for grammatical development according to the DSS criteria (see Appendix F) (Lee, 1974). Any score which fell below the 10th percentile assigned to its chronological age was considered language delayed.

At this point a third group was created for the purpose of this study. Children who were included in the late talking group at age 2 and whose DSS score fell above

the ninth percentile at age 4, were placed in a history of language delay group. Although a child is not classified as language delayed at age 2 when their expressive language does not fall within the parameters for normal development as defined by Rescorla (1989), this term was chosen to be consistent in distinguishing the history of language delay group from those children who performed similarly at age 2, and at age 4 continued to fall below the range of normal expressive language as measured by their DSS score. The children who continued to fall below the normal range were now reclassified as the chronic language delay group.

The preceding selection yielded a subject population of: 22 children with language skills falling into the normal range at age 2 and age 4 (chronological age at follow-up = 48-58 months); 10 children with a history of language delay (chronological age at follow-up = 48-57 months); and 13 children with a chronic language delay (chronological age at follow-up = 48-59 months). (See Table I).

PROCEDURES

Experimental Procedures

Before beginning the language sample taping, the examiner told the parent, "Play with your child as you do at home." A toy house with accompanying people, furniture, and cars, as well as blocks and play dishes were provided. A

TABLE I
GROUP DESCRIPTION

Measure	<u>n</u>	Age		DSS		<u>SD</u>	% Males
		Mean ^a	<u>SD</u>	Mean	<u>SD</u>		
Normal	22	50.6	2.5	7.3	1.1		64
History of language delay	10	50.6	2.8	7.3	.72		90
Chronically delayed	13	52.5	3.0	4.06	1.2		85

^ain months

language sample was audiotaped while a child and parent played with toys for approximately 15 minutes.

Each subject's language sample was transcribed by hand according to Miller's (1981) procedures. Standard English spelling was used, and utterance contours were determined by rising and falling intonation and pauses of greater than 2 seconds.

The DSS (Lee, 1974) procedure was applied to all the language samples obtained at the 4-year-old evaluations, with up to a maximum of 50 utterances scored. Any score which fell below the 10th percentile assigned to its chronological age was considered language delayed.

For the retelling task, the examiner showed the subject The Bus Story picture book (Renfrew, 1977), which has four pages with three pictures on each page (Appendix E). The examiner told the subject: "I'm going to tell you a story about this bus. When I'm finished, you can tell me the story." The examiner pointed to each picture as she read the prewritten text of The Bus Story with no repetitions. After completion of the story the examiner told the subject, "Now you tell me the story. Once upon a time" The child was audiotaped while telling the story to the examiner. If necessary, the examiner prompted by saying "and then" with an upward intonation, or repeated the previous utterance spoken by the child, or asked "What happened?" The administration time of The Bus Story was approximately 7 minutes.

Before scoring the story retellings, they were arranged in numerical order according to randomly assigned subject numbers. Consequently, the coding was not influenced by group assignment.

INSTRUMENTATION

The subjects' narrations of The Bus Story (Renfrew, 1977) and spontaneous language samples obtained at age 4 were audiotaped using a Sony model cassette tape recorder, a Sony ECM-D8 electret condenser microphone, and Sony brand cassette tapes.

The DSS (Lee, 1974) quantifies 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 (see Appendix F). Lee has established norms for the DSS scores (see Appendix G).

The Bus Story (Renfrew, 1977), a story retelling instrument, offers a measurement of expressive narration skills. An information score is obtained by following the criteria developed by Renfrew which assigns points for essential and secondary information retold (Appendix H).

A sequence score based on the pictures and text of The Bus Story (Renfrew, 1977) was developed by this investigator to quantify the child's ability to retell The Bus Story in the same sequence as the original story (see Appendix I).

Adequacy of cohesion used in The Bus Story narrations was scored according to the criteria developed by Liles (1985) (see Appendix J).

T-units is a term proposed by Hunt (1965) as a means of segmenting written or spoken discourse. Use of T-unit segmentation allows computation of utterance length without undue influence from run-on sentences. Each unit is minimal in length and is "grammatically capable of being terminated with a capital letter and a period" (p. 21). In other words, the unit is structurally complete and able to stand as a sentence. Scott (1988b) further clarified T-unit segmentation with her definition:

The T-unit consists of a main clause with all subordinate or nonclausal structures attached to or embedded within. All main clauses that begin with coordinating conjunctions *and*, *but*, *or*, indicate a new T-unit unless there is co-referential subject deletion in the second clause. (p. 55)

The Systematic Analysis of Language Transcripts (SALT), a computer software program that analyzes morphemic and semantic aspects of language (Miller & Chapman, 1985), was used to analyze number of morphemes per T-unit produced in the narrative, as well as number of word roots and total number of words produced by each subject.

CODING AND ANALYSIS OF NARRATIVE SAMPLES

Transcription

The Bus Story (Renfrew, 1977) retellings were fully transcribed by hand, including nonfluencies, corrections,

and asides, which were bracketed and excluded from the final analysis. Because a procedure used by the examiner to encourage the child to continue telling the story is to say "and then . . . ?" with a rising intonation, any words produced by the child in direct repetition of the examiner, were also bracketed and deleted from the final analysis.

Information Score

The Bus Story retellings were first scored for information according to Renfrew's (1977) criteria (see Appendix H). The investigator read the transcription line by line and compared its content to Renfrew's scoring criteria. Points earned were noted in the margin next to the information scored. Essential items retold received two points, and subsidiary items received one point. The total of points became the information score for each subject.

T-Unit Segmentation

Next the transcriptions were entered onto an IBM-compatible personal computer equipped with the SALT program. The investigator relistened to each narration, segmented the utterances first according to intonation contours, and then reexamined the utterances further segmenting them into T-units. New T-units that were a continuation of an utterance were coded [T] before the first word of the new T-unit. All comments, nonfluencies and direct repetitions of the examiner were retained and bracketed. The bracketed portions in the transcript were not included in the final

analysis. The investigator counted the number of T-units used in the story retelling task and the SALT program analysis computed the mean length per T-unit in morphemes.

Sequence Score

Each subject's narration was scored to quantify their ability to repeat the sequential order of events of The Bus Story (Renfrew, 1977). A model of 20 sequential events (Appendix I) was developed by the investigator. A score sheet numbered 1-20 was used for scoring. The investigator read the first line of the narration. If event #1 on the model was mentioned, a "+" was placed next to #1 on the score sheet. If event #1 was not mentioned, it received a "-". If the child told event #1 followed by event #5, a "+" was marked next to #1 and #5 on the score sheet, with the intervening events #2, #3, #4 all receiving a "-", even if they were mentioned later in the story out of sequence. The "+" scores were added, with one point received for each event told in the correct order. Total number of points received became the sequence score.

Cohesion Adequacy

Each subject's narration was coded for use of cohesion using Liles' (1985) criteria for identifying cohesive markers and judging cohesive adequacy (see Appendix J). The investigator read the whole transcript, then reread it line by line. Any word whose meaning was dependent on information outside that T-unit was circled. If the

information needed was available within that T-unit, the word was not judged as a cohesive marker, as in "it was a naughty bus." For consistency in scoring, "the road" was never counted as a cohesive marker. If more than one conjunction was marked within a T-unit, only the more complex conjunction was counted in the final scoring, using Liles' hierarchy of most complex being causal, followed by adversative, temporal, and additive.

After the cohesive elements in a story retelling were circled, they were transferred to a scoring sheet for that subject. Next to the cohesive element, the investigator noted the line number in the transcript in which it occurred as well as its referent. A judgement of the cohesive element as complete, incomplete, or erroneous was made at this time. Complete ties were those with unambiguous and easily found referents. Incomplete ties were those which required information outside the T-unit, but the information was not there. Erroneous ties were those which referred to ambiguous information. Occurrences of each of these types of judgements were added to obtain a total frequency of use of cohesive markers. The percentage of cohesive elements used in a narrative which were complete ties was determined.

Word Roots

The SALT program counted the number of different word roots produced by each subject in their narration. The

total is an index of the diversity of the subject's expressive vocabulary.

New Propositions

Idea units in discourse or propositions (Kintsch, 1977) are an essential element in narration. The total number of propositions in the narration were counted, and the number of original or unrepeated ideas were counted and divided by the total number of propositions mentioned to determine the percentage of new propositions contained in the narration. This measure gave an indication of the extent to which the narrations were efficient and did not contain repetitive elements.

Research Design

The design is a complex group design. There is one independent variable—language diagnosis—with three levels: normally achieving, history of language delay, and chronic language delay. There are seven dependent variables which are repeated measures of The Bus Story (Renfrew, 1977) retelling task: information score, sequence score, percentage correct cohesion used, mean length per T-unit in morphemes, number of different word roots produced, narration length in T-units, and percentage of new propositions produced.

Statistics

First, the data were summarized by computing each group's mean, standard deviation, and range for each of the

dependent variables. These descriptive statistics were used to organize the data.

Next, a three-way analysis of variance (ANOVA) was used to determine whether the differences among the groups' performances were significant for each variable. If a significant F ($F > 3.23$, at the .05 significance level) was found, then a post-hoc multiple comparison was done using a Tukey Multiple Comparison Test to determine where differences between groups existed.

Reliability

Graduate students in the Speech and Hearing Sciences Program were selected and trained to perform all of the reliability tasks. Ten percent of the spontaneous language samples were randomly selected and transcribed by two graduate students, and a point to point comparison was done on 10% of the utterances transcribed. The number of words in agreement was divided by the total number of words transcribed, and an agreement score of 91% was derived.

A portion of the transcripts (15%) were randomly selected and scored by a second trained researcher who was a graduate student in speech language pathology.

On the narration scoring, interrater reliability was calculated by determining the percentage of agreement for the information scores (95%) and occurrence of complete cohesion (95%). Sequence score reliability was determined by a point-to-point check, with agreement being 96%.

CHAPTER IV

RESULTS AND DISCUSSION

RESULTS

The specific objective of this study was to determine whether there are differences in narrative ability in 4-year-old children that can be related to language characteristics at age 2.

The research question asked was: On a story retelling task, do the narrative skills of children with a history of language delay differ significantly from their normally developing peers on the seven variables examined: information score, sequence score, percentage of complete cohesion used, mean length of T-unit in morphemes, word root total, story length, percentage of new propositions used.

The means and standard deviations of each group for each of the dependent measures were computed. These are shown in Table II.

The data were analyzed to determine whether significant differences existed between the language diagnostic groups of normal, history of delay and chronic delay on measures of the story retelling task in order to answer the research questions.

TABLE II
 RANGE, MEAN, AND STANDARD DEVIATION OF EACH GROUP
 FOR EACH OF THE DEPENDENT MEASURES

Measure	Group	Minimum	Maximum	Mean	<u>SD</u>
Information	Normal	11.0	39.0	23.3	7.8
	History of delay	12.0	29.0	21.0	5.3
	Chronic delay	3.0	27.0	14.5	7.6
Sequence	Normal	5.0	17.0	10.5	3.2
	History of delay	5.0	14.0	9.5	2.9
	Chronic delay	1.0	11.0	6.3	3.1
Percentage complete cohesive elements	Normal	1.0	84.0	51.8	22.5
	History of delay	8.0	70.0	46.3	20.7
	Chronic delay	11.0	88.0	26.8	22.8
Mean length per T-unit	Normal	4.5	9.4	7.4	1.5
	History of delay	5.4	8.5	7.1	1.1
	Chronic delay	1.1	7.2	4.9	1.5
Number of word roots	Normal	33.0	74.0	57.1	11.6
	History of delay	33.0	65.0	48.8	9.7
	Chronic delay	11.0	60.0	37.8	14.2

TABLE II
 RANGE, MEAN, AND STANDARD DEVIATION OF EACH GROUP
 FOR EACH OF THE DEPENDENT MEASURES
 (continued)

Measure	Group	Minimum	Maximum	Mean	<u>SD</u>
Narration length in T-units	Normal	9.0	21.0	15.2	3.1
	History of delay	9.0	18.0	13.6	3.1
	Chronic delay	11.0	24.0	16.8	4.4
Percentage of new propositions encoded	Normal	78.0	100.0	94.7	6.5
	History of delay	86.0	100.0	95.3	5.6
	Chronic delay	29.0	100.0	83.2	21.2

The Bartlett Test for homogeneity of group variances was done on each of the dependent measures, and the populations were found to be approximately normally distributed, except for the percentage of new propositions produced.

Table III displays the F values for those variables which met the assumptions for parametric statistics and the Tukey test results for those variables which had a significant F value ($F > 3.23$ at the .05 significance level).

Because the percentage of new propositions variable did not meet the assumptions for parametric statistics, a

TABLE III

ANOVA AND TUKEY TEST RESULTS

Variables	ANOVA results $\bar{F}$	Tukey results		
		Normal vs. history of language delay	Normal vs. chronic language delay	History of delay vs. chronic language delay
Information score	5.96*	NS	$\bar{p} < .05$	NS
Sequence	7.47*	NS	$\bar{p} < .05$	$\bar{p} < .05$
Cohesion	5.00*	NS	$\bar{p} < .05$	NS
MLU/TU ^a	13.81*	NS	$\bar{p} < .05$	$\bar{p} < .05$
Number of word roots	10.64*	NS	$\bar{p} < .05$	NS
Story length in T-units	2.34			

^aMean length of utterance in morphemes.

nonparametric Kruskal-Wallis test was computed to test for differences between pairs of means. No significant difference was found.

"The Bus Story Information Score"

A significant difference ($p < .05$) was found among groups. A Tukey test showed the normal group performed significantly better than the chronically delayed group. This indicates that those children with a chronic language delay retell significantly less information on a story retelling task than children whose language development is within normal parameters.

It is not clear whether the history of delay group is more like their normal peers or their chronic delay peers, because no significant difference was found between the normal group and history of delay group, nor between the history of delay group and the chronically delayed. As shown by the means in Table II, the history of delay group retold more information than the chronically delayed, but not enough to have a statistically significant difference.

The Sequence Score

A significant difference ($p < .05$) was found among groups. The Tukey test showed both the normal group and the history of delay group performed significantly better than the chronically delayed group. No significant difference was found between the normal group and the history of delay group. This suggests that the history of delay group's

sequencing skills in retelling a narrative are commensurate to that of the normal group.

The Cohesion Adequacy Score

A significant difference ($p < .05$) was found among groups. The Tukey test found the normal group performed significantly better at using linguistic markers to adequately link ideas than the chronically delayed group ($p < .05$). No significant difference was found between the normal group and the history of delay group or between the history of delay group and the chronically delayed group. As shown by the means in Table II, the history of delay group's use of complete cohesion was better than the chronically delayed group, but not enough better that a significant difference was found.

Mean Length of T-Units

The ANOVA found a significant difference ($p < .05$) among groups. The Tukey test found that the chronically delayed group produced significantly fewer morphemes per T-unit than both the normal and the history of delay groups. No significant difference was found between the normal group and the history of delay group. This indicates the history of delay group has "caught up" to the normal group, and produces similar amounts of morphemes per T-unit, whereas the chronically delayed group continues to produce significantly fewer morphemes per T-unit.

Total Number of Word Roots Produced

The ANOVA found significant differences ($p < .05$) among groups. The Tukey test found that the normal group used significantly more lexical diversity than the chronically delayed group. No significant differences were found between the normal group and the history of delay group or the history of delay group and the chronically delayed group. Again, this suggests the history of delay group is performing somewhere in the middle, not high enough that a statistical difference is found between the history and the chronic delay groups, yet not poorly enough that a statistical difference is found between the history group and the normal group.

Length of Story in T-Units

No significant differences were found among the groups in the number of T-units used to tell the story. The three groups produced similar quantities of utterance units in the narrative task.

Percentage of New Propositions Produced

The data collected did not fit the assumptions for an ANOVA test, so a nonparametric test, the Kruskal-Wallis, was computed. No significant difference was found. The three groups performed similarly in terms of the ratio of new ideas to total ideas produced.

DISCUSSION

Looking at the outcome of those children who did not meet the criteria at age 24 to 34 months for normal expressive language, as defined by Rescorla's (1989) criteria, one finds that less than half met the normal criteria for expressive language at age 4, as measured by the DSS (Lee, 1974) scoring of their spontaneous language samples.

The research question regarding the performance of those children who do catch up to their peers in expressive language production, as answered by the data collected, is that few significant differences on measures of narrative production are found between the history of delay group and the other two groups studied.

No significant differences were found between the history of delay group and the normal language group on any dependent measure. Children who do not meet the criteria for normal expressive language at age 2 may catch up to perform similarly to peers whose expressive language at age 2 was normally developing. The results show that this history of delay group improved their expressive language performance to the point where no significant differences were found between the history of delay group and the normal language group. Before jumping to the conclusion that the history of delay group has similar skills to the normal group, one must also consider the fact that no significant differences were found between the history group and the

chronic delay group either, except for the measures of sequence and mean length of T-unit produced. What this means is that on a story retelling task, the performance of those children with a history of language delay falls somewhere between the performance of the normal language group and the chronic language delay group, and is not different enough to distinguish this group from either of the others. This history of delay group may still have language problems that exist on a subtle level that are not currently apparent, or perhaps the measures used were not sensitive enough to distinguish the history of delay group from the normal group.

Significant differences were found between the history of delay group and the chronic language delay group on the sequence score and mean length of T-unit produced. The history of delay group has improved its ability to retell a sequence correctly and produce more morphemes per T-unit to the point where these subjects are more like their normally developing peers than their peers who have a chronic language delay. The mean length of utterance in morphemes is often used as a measure of syntactic development in preschoolers. The late bloomers were further divided into groups based on their syntactic development at age 4, as measured by the DSS (Lee, 1974). Therefore, it is not surprising that the history of delay group produced a significantly greater number of morphemes per T-unit than the chronic language delay group.

Significant differences were found between the group of children with normally developing expressive language and the group with a chronic language delay on every measure of the story retelling task except for narration length in T-units. This result is consistent with the original language grouping made at age 2 and confirmed by DSS (Lee, 1974) scores at age 4 on the language sample.

Those subjects who continue to demonstrate an expressive language delay as a group are also significantly delayed on every measure of narrative skill (other than length of story in T-units) when compared to their language normal peers. The fact that the number of T-units produced by the language-delayed group did not differ significantly from the normal group may be attributed to the structure of the story retelling task which was supported by pictures and cuing ("and then what happened . . . ?") by the examiner.

Of particular significance is the fact that the chronic delay group's poor performance extended to skills not dependent upon syntactic development. Scores for information units retold, sequence retold, and number of word roots used did not require correct or elaborate sentence structure. Those children in the chronic delay group exhibited depressed language skills not only in the area of productive syntax, but also in production of a diverse lexicon, sequencing, and information retrieval.

CHAPTER V

SUMMARY AND IMPLICATIONS

SUMMARY

There is a growing group of researchers who believe that narrative skills are the bridge from oral language to literacy (Culatta, Page, & Ellis, 1983; Roth & Spekman, 1989; Westby, 1989). Narrative production requires higher level language skills to create a cohesive discourse unit using decontextualized language. Narrative ability has also been found to be the best predictor for normal speech and language development for preschoolers with language impairments (Bishop & Edmundson, 1987) and reading comprehension achievement for learning-disabled, school-age children (Feagans & Applebaum, 1986). These same skills are prerequisites for achievement of literacy and school success.

The purpose of the present study was to compare the story retelling ability of 4-year-olds who did not achieve normal expressive language milestones at age 2 with those who did. The original group size was 22 children with normal expressive vocabulary size at age 24-34 months, as reported on the Language Development Survey (Rescorla, 1989) and 23 children whose reported expressive vocabulary size

fell below the normal range at 24-34 months, referred to as "late talkers." These two groups of children were re-examined at age 4. Each child was audiotaped producing a narrative and a spontaneous language sample. The Bus Story (Renfrew, 1977), a story retelling procedure, was administered for the narrative measure. The spontaneous language sample was scored to determine group placement at age 4.

When the spontaneous language samples were scored for syntactic complexity with Lee's (1974) Developmental Sentence Score, 10 (43%) of the original "late talking" group had scores in the normal range and were reclassified as having a history of language delay. The remaining 13 (57%) who continued to fall below the normal range were now classified as having a chronic language delay.

The narrations produced by all of the children were scored on seven measures: information retold, sequence retold, adequacy of cohesion used, mean length per utterance unit (T-unit) in morphemes, number of different word roots produced, narration length in T-units, and percentage of new propositions produced. The following questions were addressed:

1. Are the narrative skills of children with a history of language delay more like their normally achieving peers or their peers with chronic language deficits?
2. Is expressive language performance at age 2 related to performance on a story retelling task at age 4?

The data were analyzed to see if significant differences existed between the language diagnostic groups. On the measures where an ANOVA test found a significant F value ($F > 3.23$, $p < .05$), a Tukey test was done to determine where the significant differences among the groups existed.

No significant differences were found between the history of delay group and the normal group on any measures. Significant differences between the history of delay group and the chronic delay group were found on two measures—sequence and mean length in morphemes of the T-units produced in the story retelling task. Significant differences were found between the normal group and the chronic delay group on every measure of the narration task except for length of narration in T-units.

Of those children whose reported expressive language fell below normal criteria at age 2, less than half “caught up” by age 4 to their normally developing peers in syntactic development and were reclassified as having a history of language delay.

The history of delay group performed similarly to their normal peers in narrative production when the mean length of T-unit in morphemes was measured and significantly different from those placed at age 4 in the chronic delay group. This finding is not surprising, since mean length in morphemes also measures syntactic growth. The history of delay group also retold sequential events similarly to their

normal peers and significantly better than the chronic delay group.

On every other measure of the narrations produced, the history of delay group's performance fell in the middle, with no statistically significant differences found between the history of delay group and the normal group, or between the history of delay group and the chronic delay group. It is not clear whether the history of delay group may have ongoing deficits that were not measured by this study, or whether the skills of the history of delay group have improved to a normal range but are not high enough to distinguish themselves from the chronic delay group.

IMPLICATIONS

Research

Future research of interest would be to retest the history of delay group when they reach school age and determine whether they have maintained their language gains. Bishop and Edmundson (1987) as well as Scarborough and Dobrich (1990) have presented longitudinal data which suggests that children who appear to recover by late preschool years from an early language delay are still at risk for reading impairments. Of particular interest would be whether narrative skill at age 4 could be a predictor of reading skill at the second- or third-grade level.

A closer look at the group of late talkers, and the factors behind the growth of expressive language during the

period between ages 2 and 4 would also be of interest. Factors such as joint activities between the child and their parent, whether books or stories are read aloud, how much time each week is spent reading or telling stories together may illustrate some environmental influences behind the language growth of some of the late talkers. Examining the child's behavior in terms of attention span and attention to language would be of interest as well.

In order to add to the knowledge of narrative development in language-delayed preschool children, research using a slightly different procedure may be useful. A story retelling task that includes the introduction of a naive listener may result in the use of more complete cohesive elements and amount of information retold. The children in the present study retold the story to the examiner, the person who had just told them the story. It is not known whether preschoolers adjust their narration to meet the needs of their listener. The present study did not include a context in which the listener had a need for information.

Clinical

These data suggest that more than half of those children whose expressive language does not meet normal criteria at age 24-36 months will continue to have impaired language skills at age 4. As a group, those children who at age 4 fell below the normal parameters in measures of syntactic growth also differed significantly from their

normal peers in production of information, sequencing skills, use of cohesion, and lexical diversity. These are characteristics often associated with the school-age learning-disabled child. The performance of the chronic delay group on the measures of the narrative task in this study suggests a risk for future academic difficulty. Language intervention with those children whose language deficits persist at age 4 is mandated. Remediation focus should include semantic as well as syntactic and morphological goals, with work on the discourse level in addition to the sentence level.

Use of a story retelling task to make judgements of an individual's language functioning cannot currently be used to predict an individual's language outcome or future academic functioning. Clear parameters of normal language scores as opposed to language-delayed scores have not yet been defined for variables other than information on The Bus Story (Renfrew, 1977). This does not negate the clinical value of story retelling as a method of exposing an individual's higher level language abilities.

For children with a chronic language delay, depressed abilities in narrative production indicate an increased need for early intervention, particularly when intervention may decrease academic difficulty and its accompanying psychosocial consequences.

Further longitudinal research may substantiate the validity of story retelling as a predictor of future achievement in an area where few predictors exist.

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APPENDIX A

QUESTIONNAIRE FOR PARENTS OF
CHILDREN 15-30 MONTHS OLD

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 B

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 C

PARENT PERMISSION FORM

I, _____, hereby agree to serve as a subject in the research project on language development in young children conducted by Rhea Paul.

I understand that the study involves seeing my child yearly for speech and language evaluation and audiotaping conversations between me and my child. I understand that these tapes will be transcribed for analysis of my child's spoken language patterns.

It has been explained to me that the purpose of the study is to learn whether children who begin talking late are at risk for later learning problems.

I may not receive any direct benefit from participation in this study, but my participation may help to increase knowledge which may benefit others in the future.

Dr. Paul has offered to answer any questions I may have about the study and what is expected of me in the study. I have been assured that all information I give will be kept confidential and that the identity of all subjects will remain anonymous.

I understand that I am free to withdraw from participation in this study at any time without jeopardizing my relationship with Portland State University.

I have read and understand the foregoing information.

Date _____ Signature _____

If you experience problems that are the result of your participation in this study, please contact the secretary of the Human Subjects Research and Review Committee, Office of Grants and Contracts, 303 Cramer Hall, Portland State University, 464-3417.

APPENDIX D

LANGUAGE DEVELOPMENT SURVEY

Language Development Survey

Please check off each word that your child says SPONTANEOUSLY (not just imitates or understands).
It's okay to count words that aren't pronounced clearly or are in "baby talk" ("baba" for bottle.).

FOODS	ANIMALS	ACTIONS	HOUSE- HOLD	PERSONAL	CLOTHES	MODIFIERS	OTHER
apple	bear	bath	bathtub	brush	belt	allgone	A, B, C, etc.
banana	bee	breakfast	bed	comb	boots	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	excuse me
candy	cat	close	chair	paper	gloves	blue	here
cereal	chicken	come	clock	pen	hat	broken	hi, hello
cheese	cow	cough	crib	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	dry	myself
egg	frog	down	glass	umbrella	shoes	good	nightnight
food	horse	eat	knife	watch	slippers	happy	no
grapes	monkey	feed	light		sneakers	heavy	off
gum	pig	finish	mirror	PEOPLE	socks	hot	on
hamburger	puppy	fix	pillow	aunt	sweater	hungry	out
hotdog	snake	get	plate	baby		little	please
icecream	tiger	give	potty	boy	VEHICLES	mine	Sesame St.
juice	turkey	go	radio	daddy	bike	more	shut up
meat	turtle	have	room	doctor	boat	nice	thank you
milk		help	sink	girl	bus	pretty	there
orange	BODY	hit	soap	grandma	car	red	under
pizza	PARTS	hug	spoon	grandpa	motorcycle	stinky	welcome
pretzel	arm	jump	stairs	lady	plane	that	what
raisins	bellybutton	kick	table	man	stroller	this	where
soda	bottom	kiss	telephone	mommy	train	tired	why
soup	chin	knock	towel	own name	trolley	wet	woofwoof
spaghetti	ear	look	trash	pet name	truck	white	yes
tea	elbow	love	T.V.	uncle		yellow	you
toast	eye	lunch	window	Ernie, etc.		yucky	yummy
water	face	make					1, 2, 3, etc.
	finger	nap					
TOYS	foot	open					
ball	hair	outside					
balloon	hand	pattycake					
blocks	knee	peekaboo					
book	leg	peepee					
crayons	mouth	push					
doll	neck	read					
picture	nose	ride					
present	teeth	run					
slide	thumb	see					
swing	toe	show					
teddybear	tummy	shut					
		sing					
OUTDOORS	PLACES	sit					
flower	church	sleep					
house	home	stop					
moon	hospital	take					
rain	library	throw					
sidewalk	park	tickle					
sky	school	up					
snow	store	walk					
star	zoo	want					
street		wash					
sun							
tree							

Please list any other words your child uses here:

Does your child combine two or more words into phrases?
(e.g. "more cookie," "car byebye," etc.) yes _____ no _____

Please write down **three** of your child's longest and best sentences or phrases.

1. _____

2. _____

3. _____

APPENDIX E

THE BUS STORY: PICTURES AND TEXT

Source: Renfrew, C. E. (1979). The Bus Story: A test of continuous speech. Old Headington, Oxford England: Author.

(Note: Original story book is four pages long with three pictures on each page. Pictures in this appendix have been reduced 70%.)

The Bus Story

Page No.

- 1 Once upon a time there was a very naughty bus.

While his driver was trying to mend him, he decided to run away.

- 2 He ran along the road beside a train.

They made funny faces at each other and raced each other.

But the bus had to go on alone, because the train went into a tunnel.

He hurried into the city where he met a policeman who blew his whistle and shouted, "Stop, bus."

- 3 But he paid no attention and ran on into the country.

He said, "I'm tired of going on the road."

So he jumped over a fence.

He met a cow who said "Moo, I can't believe my eyes."

4. The bus raced down the hill.

As soon as he saw there was water at the bottom, he tried to stop.

But he didn't know how to put on his brakes.

So he fell in the pond with a splash and stuck in the mud.

When his driver found where he was, he telephoned for a crane to pull him out and put him back on the road again.

APPENDIX F

DEVELOPMENTAL SENTENCE SCORE:

SCORING CRITERIA

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

The Developmental Sentence Scoring (DSS) Reweighted Scores

Score	Indefinite Pronouns or Noun Modifiers	Personal Pronouns	Main Verbs	Secondary Verbs
1	it, this, that	1st and 2nd person: <i>I, me, my, mine, you, your(s)</i>	A. Uninflected verb: <i>I see you.</i> B. copula, is or 's: <i>It's red.</i> C. is + verb + ing: <i>He is coming</i>	
2		3rd person: <i>he, him, his, she, her, hers</i>	A. -s and -ed: <i>plays, played</i> B. irregular past: <i>ate, saw</i> C. Copula: <i>am, are, was, were</i> D. Auxiliary <i>am, are, was, were</i>	Five early-developing infinitives: <i>I wanna see (want to see)</i> <i>I'm gonna see (going to see)</i> <i>Lemme [to] see (let me [to] see)</i> <i>Let's [to] play (let [us to] play)</i>
3	A. no, some, more, all, lot(s), one(s), two (etc.), other(s), another B. something, somebody, someone	A. Plurals: <i>we, us, our(s), they, them, their</i> B. these, those		Non-complementing infinitives: <i>I stopped to play.</i> <i>I'm afraid to look.</i> <i>It's hard to do that.</i>
4	nothing, nobody, none, no one		A. can, will, may + verb: <i>may go</i> B. Obligatory do + verb: <i>don't go</i> C. Emphatic do + verb: <i>I do see.</i>	Participle, present or past: <i>I see a boy running.</i> <i>I found the toy broken.</i>
5		Reflexives: <i>myself, yourself, himself, herself, itself, themselves</i>		A. Early infinitival complements with differing subjects in kernels: <i>I want you to come.</i> <i>Let him [to] see.</i> B. Later infinitival complements: <i>I had to go. I told him to go. I tried to go. He ought to go.</i> C. Obligatory deletions: <i>Make it [to] go.</i> <i>I'd better [to] go.</i> D. Infinitive with wh-word: <i>I know what to get.</i> <i>I know how to do it.</i>
6		A. Wh-pronouns: <i>who, which, whose, whom, what, that, how many, how much</i> <i>I know who came.</i> <i>That's what I said.</i> B. Wh-word + infinitive: <i>I know what to do.</i> <i>I know who(m) to take</i>	A. could, would, should, might + verb: <i>might come, could be</i> 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 <i>Take whatever you like.</i>	A. Passive with <i>get</i> , any tense Passive with <i>be</i> , any tense B. must, shall + verb: <i>must come</i> C. have + verb + en: <i>I've eaten</i> D. have got: <i>I've got it.</i>	Passive infinitival complement: With <i>get</i> : <i>I have to get dressed.</i> <i>I don't want to get hurt.</i> With <i>be</i> : <i>I want to be pulled.</i> <i>It's going to be locked.</i>
8			A. have been + verb + ing <i>had been + verb + ing</i> 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>Swinging is fun.</i> <i>I like fishing.</i> <i>He started laughing.</i>

Score	Negatives	Conjunctions	Interrogative Reversals	Wh-Questions
1	it, this that + copula or auxiliary is, 's + not: It's <i>not</i> mine. This is <i>not</i> a dog. That is <i>not</i> moving.		Reversal of copula: <i>Isn't it red?</i> <i>Were they there?</i>	
2				A. who, what, what + noun: <i>Who am I? What is he eating?</i> <i>What book are you reading?</i> B. where, how many, how much, what . . . do, what . . . for <i>Where did it go?</i> <i>How much do you want?</i> <i>What is he doing?</i> <i>What is a hammer for?</i>
3		and		
4	can't, don't		Reversal of auxiliary be: <i>Is he coming? Isn't he coming?</i> <i>Was he going?</i> <i>Wasn't he going?</i>	
5	isn't, won't	A. but B. so, and so, so that C. or, if		when, how, how + adjective: <i>When shall I come?</i> <i>How do you do it?</i> <i>How big is it?</i>
6		because	A. Obligatory do, does, did: <i>Do they run? Does it bite?</i> <i>Didn't it hurt?</i> B. Reversal of modal: <i>Can you play? Won't it hurt?</i> <i>Shall I sit down?</i> C. Tag question: <i>It's fun, isn't it?</i> <i>It isn't fun, is it?</i>	
7	All other negatives: A. Uncontracted negatives: I can <i>not</i> go. He has <i>not</i> gone. B. Pronoun-auxiliary or pronoun-copula contraction: I'm <i>not</i> coming. He's <i>not</i> here. C. Auxiliary-negative or copula-negative contraction: He <i>wasn't</i> going. He <i>hasn't</i> been seen. It <i>couldn't</i> be mine. They <i>aren't</i> 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. 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 <i>where</i> you are. Don't come <i>till</i> I call. B. Obligatory deletions: I run faster <i>than</i> you [run]. I'm <i>as big as</i> a man [is big]. It looks <i>like</i> a dog [looks]. C. Elliptical deletions (score 0): That's <i>why</i> [I took it]. I know <i>how</i> [I can do it]. D. Wh-words + infinitive: I know <i>how</i> to do it. I know <i>where</i> 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?</i> <i>Couldn't he have waited?</i> <i>Could he have been crying?</i> <i>Wouldn't he have been going?</i>	whose, which, which + noun: <i>Whose car is that?</i> <i>Which book do you want?</i>

APPENDIX G

DEVELOPMENTAL SENTENCE SCORE:

NORMS

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

Norms for Developmental Sentence Scoring (Reweighted)

APPENDIX H

THE BUS STORY:

INFORMATION SCORE CRITERIA

Source: Renfrew, C. E. (1977). The Bus Story: A test of continuous speech. Old Headington, Oxford, England: Author.

Scoring for Information

Two points are given for each idea forming an essential part of the story, one point for each subsidiary item mentioned.

Score only those items listed below.

Main Items

2 points each
(1 point for half of item given)
ran away/off
beside/met train
alone
train in tunnel
into city/town
saw/met policeman
(policeman) said Stop
ran on/didn't stop
into country
tired of road
jumped over fence/gate
met/saw cow
ran downhill
saw pond/water/river
tried to stop
couldn't brake
went/fell in water/pond/river
found by driver
(driver) got crane
pulled out

Subsidiary Items

1 point each

naughty/bad
(driver) mending/fixing
(bus) decided
made faces
raced
(policeman) blew whistle
no attention

(cow) mooed
(cow) talked
(cow) couldn't believe eyes

splash
stuck
in mud
(driver) telephoned

APPENDIX I

THE BUS STORY:

SEQUENCE SCORE

Sequence Score

The following lists the order of events of The Bus Story (Renfrew, 1976), based on visual information in the pictures and the text of The Bus Story book.

SCORING METHOD: Read the first utterance of the child's narrative and indicate with a "+" if event #1 is told. Work through the narrative in this manner, reading each utterance and scoring elements mentioned on the score sheet. Thus if events are out of sequence, the first event the child mentions gets a "+" score next to the appropriate number on the score sheet, with all events not mentioned preceding that point receiving a "-" score, even if they are mentioned later.

Mention of 2 out of 3 (subject-verb-object) elements qualifies for a "+" score for a sequential element. "He" is sufficient for subject of the sentence.

1. There was a bus. (naughty, bad etc. descriptors not necessary to score. Must say more than "A bus" or "The bus")
2. Driver trying to fix bus.
3. Bus ran away.
4. Bus met/raced/made faces (any of these ideas ok here) with train.
5. Train went into tunnel.
6. Bus alone/lonesome/by itself.
(NOTE: event #6 may precede #5 if events joined by a causal conjunction. In this case, both events would receive credit.)
87. Bus went into city.
8. Policeman blew whistle +/- or told bus to stop.
9. Bus didn't pay attention/listen/hear.
10. Bus went into country.
11. Bus tired of road.
(NOTE: #11 may precede #10 and both events receive credit if events joined by causal conjunction.)
12. Bus jumped over a fence.
13. Bus met/saw a cow.
14. Cow talked/"moo"/"I can't believe my eyes." ("Moo" alone is credited).
15. Bus raced down hill.
16. Bus couldn't put on brakes/couldn't or didn't stop.
(NOTE: #17 may precede #16, with both events receiving credit if the events are tied with a causal conjunction.)
17. Bus fell in pond/water.
18. Bus stuck in mud.
19. Driver/crane found/pulled/lifted out bus.
20. Bus back on road.

20 points = highest possible score

Sequence Score Example

SCORING	SAMPLE NARRATIVE
1. +	There was a naughty bus
2. -	
3. +	And he decided to run away
	He run away
4. +	Met a train
5. -	
6. +	And after that he lonesome
7. +	And the train went in a tunnel
8. +	When the bus came into town the
	policeman blowed his whistle
9. +	But he never took no notice
10. +	So he went on
11. +	He said, "I don't like on the road no more"
12. +	So I'll jump over the fence
13. +	And he met a cow
14. -	
15. -	
16. +	And then he couldn't stop the brakes
17. +	He went in the puddle
18. -	
	And then the bus driver came after it
19. +	And he brought a crane to lift it out
20. -	

14 = Total points

APPENDIX J

COHESION SCORING PROCEDURE:

Source: Liles, B. Z. (1985). Narrative ability in normal and language disordered children. Journal of Speech and Hearing Research, 28, 123-133.

Procedure for the Identification of Cohesive Markers

In this procedure it is important that the examiner be familiar with the original story being retold. First, read the entire narrative to get an overall sense of the text. Then read each sentence separately as a complete unit before identifying those items in the sentence that mark cohesion.

At this stage in the procedure the examiner views each sentence as isolated from the text. From this viewpoint the examiner judges an item to be a cohesive element or not under the following conditions.

1. *Definition of a cohesive marker.* An element is identified as a cohesive marker if its meaning cannot be adequately interpreted by the listener and if the listener must “search” outside that sentence for the completed meaning.

In addition, an element may be judged a cohesive element if it is used as a linguistic marker that leads the listener to “expect” that its interpretation is outside the sentence (e.g., definite articles).

2. *Relationships within the sentence.* Do not judge an item as a cohesive marker if the information referred to is recoverable within the sentence. The following are examples of information recovered within the sentence .

Some boys took *their* car home.

Personal reference *their* refers to *boys*; therefore, the information is recoverable within the sentence.

There was *this* scientist that had a hideout in *these* mountains where there was *this* radar tower to blow up metal things that fly in the air.

In the example above the information referred to by the use of *this* and *these* as selective demonstrative references (Halliday & Hasen, 1976, p. 70) is recovered within the sentence. Thus, the examiner would not identify *this* or *these* as a cohesive marker (i.e., information recoverable outside the sentence).

The next example demonstrates a cohesive and a noncohesive marker in the same sentence.

One of the boys went home.

The demonstrative reference *the* marks which or what *boys*, and serves as a cue to the listener that the information is recoverable outside the sentence and is, therefore, cohesive. However, *one* refers within the sentence to *boys* and is not a cohesive marker.

3. *Text influence on judgment.* Although this procedure calls for the examiner to view each sentence as independent from the text when identifying cohesive

markers, there are instances when the text must be considered. For example, in the sentence,

Marie didn't want to go on the hike.

the listener may need more information about Marie in order to comprehend the text. In this particular text, the listener would ask, "Who is Marie?"

Thus the decision as to whether a particular item is a cohesive marker or not is "text dependent." As texts vary specific items may vary in their cohesive function.

- (a) *Text influence on demonstrative reference.* While *the* is a selective demonstrative reference, it may also be used in combination with words to express a unit of meaning (e.g., "*the* road," "*the* radio," "*the* newspaper"). It may be difficult to determine when the speaker intends *the* as a selective demonstrative reference or if *the* is used as an uninflected functor. To make this judgment, the examiner must take the text into consideration. For example, if the speaker used "the road" and the examiner judges that reference to a particular road is important within the text, he/she may judge that the speaker intended *the* to be used as a selective reference and would follow identify it was a cohesive marker. The following rule will facilitate this judgment:

If in doubt about the use of because of the above reasons, do not code *the* as a selective demonstrative reference if *a* or *some* can be substituted without producing a crucial change in the meaning of the text.

4. *Two or more cohesive markers within a sentence.*

- (a) *Conjunctions.* When two or more conjunctions (e.g., *and then* or *and so then*) are conjoined in a sentence, code only one of the conjunctions as a cohesive item. Select the conjunction that is the most complex according to the following hierarchy: (a) Causal, (2) Adversitive, (3) Temporal, and (4) Additive.
- (b) *Reference: Demonstrative and comparative.* When both a demonstrative and comparative reference are used (e.g., *the other*) code only as one cohesive item (comparative) rather than as two items (demonstrative and comparative).
- (c) *Reference: Personal and demonstrative.* If two or more references (i.e., either personal or demonstrative) are judged to be cohesive in the same sentence, code all markers even though they refer to a common reference, for example:

He took his comic books home.

Although the sentence structure indicated that *his* refers within the sentence to *he*, there is no lexical support within the sentence to

provide the listener with the information needed to know to whom *his* refers. Therefore, *he* and *his* are both cohesive.

After the examiner has identified the cohesive markers within each sentence according to the procedure presented above, he/she then reread the sentence with a difference perspective. The markers that had been identified as cohesive are now viewed as part of the text.

Since each cohesion marker must (or should) be tied to the information recoverable elsewhere in the text, the examiner locates the sentence containing the tied information. The sentence number and item are noted. Then, based on the type of relationship evidenced by the tie, the examiner classifies the cohesive marker according to the linguistic description by Halliday and Hasan (1976).

Procedure for the Identification of Cohesive Adequacy

1. *Complete tie.* A tie is complete if the information referred to by the cohesive is easily found and defined with no ambiguity.
2. *Incomplete tie.* A tie is judged to be incomplete if the information referred to by the cohesive marker is not provided in the text, for example,

Two boys went to see a movie.
They saw *his* car parked in front.

In this example the speaker had not provided the information (i.e., whose car?) but used the personal reference *his*, cueing the listener to recover the information outside the sentence.

3. *Erroneous tie.* A tie is judged to be an error if the listener is guided to ambiguous information, for example,

Homer and Freddie went to the movie.
He enjoyed it very much.

In this case the listener would not know which boy enjoyed the movie.

An item is also judged as an error if the referent leads the listener to erroneous information. Naturally the examiner must know the text in order to make this judgment.

Conjunctions are a special case of erroneous tying. Since one cannot judge reliably an inappropriate use of a conjunction as incomplete, all conjunctions that are not completely adequate are judged to be errors. Accordingly, if the ideas or messages presented in the two conjoined sentences are unrelated or inappropriately sequenced, the conjunction used to join the ideas are judged to be errors.