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Enhancing Discourse Fluency by Increasing Work Selection Proficiency in School-Age Children With Language Learning Disorders.

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proficiency in school-age children with language learning
disorders**

Stiegler, Lillian Nielsen, Ph.D.

The Louisiana State University and Agricultural and Mechanical Col., 1994

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300 N. Zeeb Rd.
Ann Arbor, MI 48106

ENHANCING DISCOURSE FLUENCY
BY INCREASING WORD SELECTION PROFICIENCY
IN SCHOOL-AGE CHILDREN WITH LANGUAGE LEARNING DISORDERS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

In

The Department of Communication Sciences and Disorders

by
Lillian Nielsen Stiegler
B.A., Nicholls State University, 1979
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May, 1994

To Benny

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TABLE OF CONTENTS

DEDICATION.....	11
ACKNOWLEDGMENTS.....	111
LIST OF TABLES.....	vii
LIST OF FIGURES.....	viii
ABSTRACT.....	lx
INTRODUCTION.....	1
Nature of the Problem.....	3
Treatment Considerations.....	8
Summary.....	16
REVIEW OF THE RELEVANT LITERATURE.....	19
Normal Behavior.....	20
Normal Development.....	29
Word Selection Behavior in LLD Children.....	31
Theoretical Considerations.....	40
Intervention Options.....	49
Summary.....	64
METHOD.....	66
Subjects.....	68
Materials.....	74
Procedures.....	76
Data Analysis.....	90
RESULTS.....	92
Quantitative Analysis.....	93
Qualitative Analysis.....	103
DISCUSSION.....	114
Summary of Findings.....	114
Relationship of Findings to Literature.....	115
Theoretical Considerations.....	128
Implications.....	135
REFERENCES.....	138
APPENDIX A: PARENTAL PERMISSION FORMS.....	145
APPENDIX B: DESCRIPTIONS OF STIMULI FOR PICTURE- ELICITED NARRATIVES.....	148
APPENDIX C: CONVERSATION STARTERS USED AS STIMULI.....	152

APPENDIX D: SAMPLE TRANSCRIPTS FROM INITIAL BASELINE...	158
VITA.....	164

LIST OF TABLES

1. Discourse Nonfluencies Related to Word Selection.....	25
2. Subjects' Scores on Standardized Tests.....	70
3. Treatment Schedule.....	78
4. Discourse-Based Intervention for Word Selection Difficulty.....	84
5. Comparison of Initial Baselines to Posttreatment Baselines.....	98
6. Comparison of Baseline Phases to Adjacent Treatment Phases.....	100

LIST OF FIGURES

1. Percentages of overt word selection behaviors relative to total words produced by Subject 1 during three discourse tasks.....	94
2. Percentages of overt word selection behaviors relative to total words produced by Subject 2 during three discourse tasks.....	95
3. Percentages of overt word selection behaviors relative to total words produced by Subject 3 during three discourse tasks.....	96
4. Mean percentages of overt word selection behaviors produced by all three subjects during baseline phases.....	102

ABSTRACT

There is growing clinical and research interest in the area of children's "word finding" difficulties, but treatment efficacy data are sparse. Previous treatments have been concerned with training students with language-learning disorders (LLD) to retrieve pre-selected, concrete nouns. Recommended intervention strategies have included retrieval exercises and activities focused on improving students' elaborative knowledge of training exemplars. The current study presents and evaluates a discourse-based, contextual intervention strategy for increasing word selection proficiency and discourse fluency.

Three nine year old boys with diagnosed language-learning disorders participated in three discourse tasks: picture-elicited narratives, story-retelling, and conversation. During treatment, the experimenter identified problematic word selection behaviors as they occurred, allowed their completion, then provided appropriate feedback. Feedback consisted of (1) requests for associative information, (2) requests for clarification, (3) comments to confirm the appropriateness of word choices, and (4) comments to facilitate discourse restructuring. All sessions were videotaped, then transcribed, coded and analyzed.

All three subjects exhibited a decrease in the production of problematic word selection behaviors from initial baseline to posttreatment baseline. One subject demonstrated a significant decrease in overt word selection behaviors when baseline phases were compared with adjacent treatment phases. All subjects exhibited greater observable word selection difficulty when engaged in the story-retelling task. In addition, they all produced significantly more overt word selection behaviors during communication units that were above average in length.

These results support the belief that children's "word finding" problems are symptoms of more generalized language deficits. Moreover, the symptoms are highly variable depending upon the demands of each linguistic task. Clinical intervention should be provided in such a way that students are afforded multiple opportunities to engage in meaningful discourse throughout the school day. When problematic word selection behaviors occur, speech-language pathologists and teachers should provide appropriate feedback designed to help students shift from less productive to more productive word selection processing.

INTRODUCTION

Every time a child is asked to respond orally in class, he takes a mini pop quiz. Teachers need to know if students are comprehending the required curricular material, so they often ask questions that elicit one-word answers, followed by feedback regarding the appropriateness of the answer, like this:

Teacher: Ben, what is the capital of Alaska?

Ben: Juneau.

Teacher: Very good.

When children are able to choose words rapidly and effortlessly, teachers deduce that they have been paying attention and have learned certain little nuggets of information. Unfortunately, there is a population of students with language-learning disabilities (LLD) who rarely experience such success. They tend to produce discourse that is riddled with speech errors and repair behaviors (Damico, 1985; German, 1992; Norris & Hoffman, 1993; Wiig, 1989). They hesitate and appear to stall for time as they struggle to select specific words that will best convey their messages. The focus of this study will be to identify instructional methods that facilitate more efficient word selection and increase discourse fluency in students with LLD, and thereby improve their classroom effectiveness.

Consider the following transcript of an LLD child's interaction in class:

Teacher: Joseph, what is the capital of California?

Joseph: Uuuuh... wait, it's like, mm... it's something like a s- sack...

Teacher: Can somebody help Joseph?

Karen: Sacramento.

Teacher: Excellent, Karen.

The teacher has asked for a fragment of decontextualized information, and the one word answer must be exact. Joseph may have tried to memorize the state capitals from a list, but he has no other knowledge of this abstract (to him) place called Sacramento. Because his answer is slow and effortful, Joseph fails the pop quiz. The teacher may now make certain deductions: Joseph has not learned the state capitals. He has not been listening. He has not studied. Perhaps the teacher decides that Joseph doesn't care to learn those capitals, or that he is just not smart enough. To make matters worse, these negative conclusions may only be strengthened if the teacher asks Joseph a question that requires a more complex answer:

Teacher: Now that we've read the section in the book, Joseph, can you describe the voyage of Columbus?

Joseph: Well, he had these three boat uh ships

like, and um he uh, he uh had some
guys... he had like a um crew and uh...

In this instance, Joseph is being asked to create an organized discourse structure to discuss a topic which (a) is outside the realm of his own experience and prior knowledge, (b) requires references to people, objects and events outside of the present context, and (c) demands the use of precise terminology. As he struggles with word selection and discourse production, the actual content of his comments may be overlooked, and he runs the risk of being interrupted and cut off before he is able to complete his answer. When this happens to LLD students regularly, in many different classes, with many different teachers, another obstacle is placed in their already difficult academic path.

Nature of the Problem

Approaching the problem from different perspectives, researchers and clinicians have defined, categorized, quantified, and searched for possible causes of the discourse nonfluencies of LLD children. They have also taken steps toward designing and evaluating intervention strategies. This section will present a general discussion of the problem as viewed by investigators of children's word finding skills and by researchers who have studied children's narratives. A summary of current treatment

options will be provided, along with a review of the alternative treatment being evaluated in the present study.

Children's "Word Finding" Difficulties

Over the past ten years, several investigators have focused their attention on the naming difficulties and linguistic nonfluencies produced by school age children who were low achievers. They believed these behaviors were manifestations of word finding problems, similar to the naming difficulties exhibited by adult aphasics. One group of studies identified a high incidence of word finding problems in students labeled dyslexic (e.g., Griffiths, 1991; Murphy, Pollatsek & Well, 1988; Rudel, Denckla & Broman, 1981; Wolf, 1982, 1984; Wolf & Goodglass, 1986). Another cluster of studies correlated word finding problems with expressive language disorders (e.g., Kall & Leonard, 1986; Leonard, Nippold, Kall & Hale, 1983; McGregor & Leonard, 1989). A third set of investigations resulted in the finding that students with learning disabilities also demonstrated considerable difficulty with word finding (e.g., German, 1983, 1984, 1987; German & Simon, 1991).

The subjects of these studies all had difficulty with tasks such as rapidly naming pictures on cards or naming items belonging to a category. In discourse, these children frequently hesitated, used imprecise terms, reformulated clauses, and revised or repeated words. Researchers systematically categorized these behaviors, and

speculated that they were due to problems in accessing known words and/or storing learned words. Some began to view the presence of word-finding problems as a common characteristic linking several childhood disabilities.

Information from Children's Narratives

As the above studies on children's word finding were taking place, there was great progress in the area of children's narrative development. Investigators compared normally achieving students with subjects who, like those in the word finding studies, bore diagnostic labels of dyslexia, language disorder, and learning disability (e.g., Crais & Chapman, 1987; Merritt & Liles, 1987; Norris & Bruning, 1988; Roth & Spekman, 1986, 1989). Narrative discourse samples (e.g., story retelling and personal experience monologues) were examined for clues about why these children were having trouble in school. Like those who studied word finding, these researchers found many examples of so called word finding problem behaviors in discourse samples produced by low achieving students. There were, however, differences in the ways the behaviors were interpreted, compared to the conclusions drawn by the researchers studying word finding problems.

First, these investigators found that their subjects were not good storytellers (e.g., Merritt & Liles, 1987; Norris & Bruning, 1988). The children demonstrated difficulty discussing one central idea in an orderly

manner. In their attempts at narrative tasks, the subjects would frequently interrupt their own speech to reformulate clauses or insert new information. The researchers did not relate these interruptions to poor word finding skills, but to difficulties with the structuring of discourse (Norris & Hoffman, 1993).

Secondly, it was discovered that while children with LLD could sometimes use superficial, perceptual knowledge of certain lexical forms to "pass" standardized tests of vocabulary and language competence, they were often unable to use the identical forms functionally in narratives (Norris & Bruning, 1988). When LLD subjects were asked to tell stories about events outside of their present context, they struggled to generate specific vocabulary. They frequently started and stopped, repeated and revised, stalled for time, resorted to using indefinite references and less appropriate terms, and even gave explanations for their difficulties. The narrative researchers viewed these word selection problems as the result of insufficient linguistic integration and flexibility (Norris & Hoffman, 1993). In other words, these investigators did not believe that LLD children had specifically dysfunctional lexical access or storage systems, but a lack of flexible, reversible processing of semantic and discourse knowledge.

A third, and perhaps most important, insight gained from the study of children's narratives was that many

diagnostic labels have been created to describe the same fundamental problem: some children do not use language flexibly enough to do well in school. The narrative researchers demonstrated that there is a wide range of functioning among inflexible language users. At one end of the continuum are those children whose language systems are extremely disintegrated and inflexible, and who are likely to experience school failure very early on. At the other end are students with greater language flexibility, who only demonstrate observable difficulty when required to use language in highly abstract, decontextualized ways (Norris & Hoffman, 1993). A lack of linguistic flexibility can be reflected across all facets of language learning, including listening, talking, reading, and writing (Norris & Hoffman, 1993). This explains why separate groups of word finding researchers found similar problems in poor readers, poor talkers and poor learners: they were all studying members of the same language-learning disabled (LLD) population.

Common Concerns and Objectives

The researchers who studied word finding and those who studied narrative development shared some common concerns and objectives. They all knew (1) that children with LLD often produced discourse that was difficult for listeners to accept and understand, (2) that these children frequently struggled with word usage, and (3) that these behaviors were associated with chronic problems in school.

Both groups of investigators were looking for ways to improve children's language competence so that they might experience academic success. The present study is intended to further their endeavors.

Treatment Considerations

Current Treatment Programs

A few authors have published treatment plans for improving word selection proficiency in children with LLD (e.g., Casby, 1992; German, 1992; McGregor & Leonard, 1989; Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984; Wing, 1990). Although these proposed approaches differed along methodological lines, they were all designed to be administered, for some or all of the sessions, in a traditional, "pull-out" model (i.e., during intervention sessions that specifically targeted word finding skills). They also shared certain basic assumptions about the major components of intervention.

Vocabulary training. The treatment programs that have been presented required that a set of vocabulary words be pre-selected for use as training exemplars, following certain general criteria. First, the training words were to be age appropriate for the students. This was to be achieved by identifying "difficult" words in the student's school, home, or recreational environments (German, 1992), or by selecting them from commercially available materials

(e.g., picture cards) designed for a certain age group (Wing, 1990). A second criterion for training exemplars was picturability. This criterion allowed clinicians to present isolated words on picture cards, at least during the initial stages of treatment (Casby, 1992; McGregor & Leonard, 1989); one program also included a suggestion that students keep a notebook with lists of old and new training vocabulary. The picturability requirement virtually dictated a third criterion, which was that training items would be primarily concrete nouns. A final criterion, common to two of the experimental programs, was that students be required to demonstrate the ability to recognize and identify certain words (by pointing to pictures) before they were chosen as training exemplars.

Elaboration training. Certain intervention procedures and exercises have been prescribed with the intention of helping LLD children build background knowledge for difficult words. Treatment plans in the literature included many different "elaboration exercises", including (a) categorizing words by function, attributes, composition, customary location, and other features; (b) comparing and contrasting features of related words; (c) thinking of rhyming words; (d) using single words and combinations of words in sentences; (e) defining words; and (f) using words to respond to specially designed riddles

(Casby, 1992; McGregor & Leonard, 1989; Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984; Wing, 1990).

Retrieval training. Authors have recommended a number of intervention techniques designed to help LLD students establish and/or reinforce efficient word retrieval strategies. Again, different authors had distinctive ideas about the types of exercises that might augment students' word accessing abilities. Among the suggestions for retrieval training were (a) using visual and/or auditory imagery (i.e., students would try to form a mental picture of the word, or a mental image of the spoken word), (b) using gestures to access words with associated actions (e.g., students would use a "sweeping" gesture to access the word "broom"), (c) practicing dividing groups of words into meaningful sets and subsets, (d) practicing thinking of all the target words in a particular category, (e) thinking of the initial phonemes of target words, and (f) imagining the place where the target item is usually found (Casby, 1992; German, 1992; McGregor & Leonard, 1989; Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984).

Additional treatment ideas. Some of the programs included the use of behavior modification techniques to extinguish so-called habitual, maladaptive nonfluencies (German, 1992; Wiig & Becker-Caplan, 1984). In addition, the notion of compensatory programming, (e.g., altering the

LLD child's environment to provide reduced oral language demands) has been introduced (German, 1992).

An Alternative Treatment

The present investigation will evaluate an intervention plan that is conducted within discourse contexts rather than the single word naming paradigms that have been used in previous studies. Because word selection processing is singled out for specific attention, the proposed contextual intervention is considered to be at a midpoint on the continuum between skill-based treatment theory and the Whole Language philosophy of learning as described by Goodman (1986). This treatment plan borrows elements from, but does not fully adhere to, the following Whole Language principles: (1) language is whole; (2) language learning is a whole to part process; (3) language expresses meaning; and (4) language learning involves willingness to take risks. The remainder of this section will provide an overview of each principle as it relates to intervention for word selection problems among school-age children.

Language is whole. According to Whole Language theory, natural language loses its meaning when it is segmented into contrived linguistic units (sentences, clauses, words, syllables, phonemes). Once language is artificially separated, it ceases to exist as a functional entity (Goodman, 1986). The resulting fragments may be so

decontextualized as to seem like nonsense to any child, but to LLD children in particular (Norris & Hoffman, 1993). Unfortunately, LLD students have been fed a steady diet of language pieces and parts. In their regular classrooms, they have faced vocabulary lists (isolated words), spelling drills (isolated words, copied five times each), phonics lessons (isolated phonemes), grammar exercises (isolated phrases, clauses, or sentences), and skills tests (combinations of isolated forms). As soon as LLD students are identified as eligible for special help, they frequently receive a watered-down version of the same type of instruction, presented at a slower pace, and sometimes with even less context (i.e., the "linguistic" basal reading texts that contain no pictures because they are considered "distracting").

Existing "word finding" treatment programs incorporate similar meaning-stripping strategies. When isolated words are used as training items, LLD students are robbed of valuable chances to experience them in interesting, meaningful contexts. They miss the opportunity to acquire information about how certain words fit into discourse structures and how they contrast with related terms (Clark, 1987). It seems that if a major objective of intervention is to build elaborated word knowledge, LLD students should have abundant practice at using words in varied and appropriate contexts.

Language learning is a whole to part process. A second fundamental aspect of Whole Language philosophy is that individual linguistic units (e.g., words) should be examined only within some natural language context (Goodman, 1986). Language learners, of course, do not acquire all the words they will ever know before beginning to combine them into messages. They hear or read a new word as it is used in different ways and in varying contexts. With each use, they learn more about the unique concept that particular word represents. At any time during this ongoing process (for each concept and its attached word), children must use the word creatively and purposefully. This is especially important for LLD students, because rich context helps to augment their language flexibility (Norris & Hoffman, 1993). If these students are forced to learn words from lists, their understanding of the words will be superficial, and the words are not likely to be used functionally in the future in other contexts.

The "word finding" treatment programs found in the literature do not emphasize the value of whole to part learning. Clinicians are advised to observe LLD students' attempts to use words as they respond to contrived naming tasks and other assessment tasks. When students experience difficulty, clinicians are told to pluck the naked words out of their contexts and to put them on a list. This is

unfortunate because LLD children would have a greater chance of learning to use the words effectively if they were afforded some contextual support.

Language expresses meaning for a purpose. Whole language philosophy encompasses the belief that students learn best when they are allowed to use language, in multiple forms, for purposeful communication (Goodman, 1986). Students should be encouraged throughout the day to share information with teachers and peers, and there should be a clear reason for each exchange. It is important for all students to become involved in frequent, normal, communicative interactions on a variety of topics included in the curriculum, but this practice is crucial for LLD students. If they are provided with assistance in creating their own discourse, they will learn to organize their thoughts into cohesive texts (Norris & Hoffman, 1993). Their increased cognitive understanding of discourse structures will result in fewer discourse interruptions and reformulations. Additionally, their increased organization of words to talk about various topics will result in more rapid and effective word selection, and attempts to communicate should be more successful.

Current intervention strategies for children's "word finding" problems have been formatted as "word practice." There is obviously no inherent message in a list of disconnected words. No real communicative function is

served when children are engaged in rhyming practice, or the repetition of definitions, or the remembering of certain words because an adult says they must. These activities may even seem suspiciously like tests to students. They may wonder why they are being asked to provide little bits of word knowledge when they are certain that their teachers or interventionists already have this information.

Language learning involves risks. Another tenet of Whole Language is that language learners must be risk-takers (Goodman, 1986). They need time to ponder what they want to say. They benefit from ample opportunity to experiment with different words and discourse structures during the school day. Most importantly, they need to feel free to make mistakes, secure in the understanding that mistakes are part of learning. It is a shame that classrooms are often such quiet places, and that partial or nearly-correct answers are often considered wrong and ignored by the teacher. For LLD students, who need as much language practice as possible, these conditions are tragic.

In fact, many LLD children experience a kind of interaction starvation. In school, they frequently become victims of what Graves (1983) aptly termed "the cha-cha-cha curriculum." The school day is broken up into so many little time periods, and LLD children are likely to shuttle in and out of so many settings (e.g., the LD resource room,

regular class, language therapy, reading lab), there is hardly time for any real communicative interaction with real people. Within the classes, teachers are so rushed to "cover" aspects of the curriculum that they often resort to worksheets and other seatwork activities, and desirable interpersonal or small group interactions just do not happen (Calkins, 1986). Even in large group instruction, LLD students may not have many opportunities to take the risks necessary to practice and refine their discourse and word selection proficiency. If these students are asked to answer a question or make a comment, their answers often contain so many errors and repair behaviors that they are difficult to follow, and the teacher avoids calling on them in the future.

Traditional treatment programs designed to remediate "word finding" do not provide for risk-taking. When LLD students have rehearsed one set of words for a long time, they simply go on to a new list, and start the process over again. There is very little room for invention or experimentation.

Summary

School-age children are often judged on the speed and effectiveness of their oral language. Students with language-learning disorders (LLD) are at a great disadvantage in the classroom because of their poor

understanding of discourse. Their responses are often disrupted by hesitations, repetitions, and other linguistic nonfluencies. Many of these behaviors can be associated with the on-line selection of specific lexical items that are most appropriate as parts of larger discourse structures.

Two sets of researchers studied the problem in low-achieving children with various diagnostic labels. One group viewed the linguistic nonfluencies as manifestations of "word finding" problems, and cited lexical access and/or storage deficits as a cause. Another group studied children's narratives, and found that, regardless of their labels, children with LLD were characteristically poor at structuring discourse and specific word selection. The investigators learned that as these children were required to use more decontextualized language, their nonfluencies increased. This group believed that children's discourse nonfluencies were due to a lack of flexible processing of semantic and discourse knowledge.

The treatment programs that have been presented to date have included various exercises intended to improve lexical access and enhance lexical storage. These exercises primarily involved training students to recall specific, pre-selected words taken out of context.

Another approach to intervention is currently being evaluated. The alternative contextual strategies were

designed with elements borrowed from the Whole Language philosophy of learning and its basic principles, which state that (a) language is whole, (b) language learning occurs whole to part, (c) language expresses meaning for a purpose, and (d) language learning involves risks. It is believed that a contextual, discourse-based intervention program will help LLD children become more proficient at discourse structuring and on-line word selection.

REVIEW OF THE RELEVANT LITERATURE

The literature contains evidence that children with LLD demonstrate considerable difficulty with on-line word selection. Researchers view this problem not as a disorder in itself, but as one symptom of several childhood disabilities associated with language. Studies of children with diagnosed dyslexia and/or documented poor reading achievement have yielded significant correlations between poor word selection proficiency and reading dysfunction (Griffiths, 1991; Murphy, Pollatsek & Well, 1988; Rudel, Denckla & Broman, 1981; Wolf, 1980, 1984; Wolf & Goodglass, 1986). Children diagnosed as learning disabled have also been shown to demonstrate significant difficulty with word selection (German, 1983, 1984; German & Simon, 1991; Wiig & Semel, 1980, 1984). A third subgroup that has been studied is children diagnosed with oral language disorders; they too have exhibited significantly higher levels of nonfluency related to the process of word selection (German, 1987, Kail & Leonard, 1986; Leonard, Nippold, Kail & Hale, 1983; McGregor & Leonard, 1989). Researchers currently view word selection difficulty as a common denominator among childhood language-learning disabilities.

The term word selection will be used throughout this paper to describe the aspect of discourse that involves planning and executing specific word choices. Other

authors have used the term "word-finding problems" to characterize both the discourse disruptions of LLD children and the naming difficulties of adult aphasics. Since the two syndromes are qualitatively different, it seems appropriate to use separate terms.

For the purposes of comparison, the first section of this chapter will summarize the literature on the word selection behaviors of typical adults and normally developing children. First, the ideal discourse delivery will be described. Next, there will be a discussion of several variables that can affect the speed and efficiency of word selection in normal adults. Third, operational definitions of some of the common types of discourse disruptions will be provided. Finally, there will be an account of how normally developing children exhibit various levels of discourse fluency as they become proficient at structuring discourse and selecting appropriate words. The fifth section will present information to support the argument that the word selection behaviors of LLD children are qualitatively different from those of adult aphasics.

Normal Behavior

Typical Extemporaneous Discourse in Adults

The ideal delivery. When people have something to say and say it fluently, pausing only at grammatical junctures (between sentences and clauses), they are giving the ideal

delivery (Clark & Clark, 1977). By definition, the ideal delivery is only an abstraction, a model of perfection that can be used for purposes of comparison. Experienced television newscasters, actors who have rehearsed their lines, and other practiced public speakers can sometimes approximate this ideal. Thanks to written scripts, repeated rehearsals, and teleprompters, there are very few disruptions in the smooth flow of their discourse, so it is easy for listeners to understand what they are saying. It is natural for all speakers to aim for the ideal delivery if they wish to be understood, especially in formal speaking situations. For those who come closest to perfect fluency, there is often quite a bonus: they may be perceived by others as more intelligent, more focused, and more capable than their less fluent peers (Clark & Clark, 1977). Conversely, those who fall far short of the ideal delivery can expect to be judged somewhat harshly by their listeners. As Clark and Clark wrote, "...it isn't considered polite to speak unless one has something definite to say, and every hesitation, uh, and false start adds to the impression that one does not have something definite to say (1977, p. 262)."

Factors that Contribute to Word Selection Problems

The discourse of daily living is rarely rehearsed. Speakers are constantly expected to answer questions, participate in conversations, and describe situations

without benefit of practice. They are forced to plan, execute, monitor, and repair their utterances during the act of production, a process that Evans (1985) termed feedforward. Normal adults can generally accomplish feedforward correction well enough to have their speech accepted by listeners, but fluency breaks do occur.

On-line word selection can be more or less difficult for normal speakers, depending on the type of discourse and the context in which it is taking place. There are at least five sources of word selection difficulty.

Task complexity. As the semantic complexity of a linguistic task increases, the speaker will have more difficulty with word selection. Describing a funny picture, for example, is a far less abstract task than explaining why that picture is humorous (Blank, Rose & Berlin, 1978; Goldman-Eisler, 1968; Norris & Hoffman, 1993). The description task requires only that the speaker provide actions or attributes of objects depicted, while the explanation requires coordinating more abstract concepts such as "humor" and "punchline." Speakers engaged in the explanation task would find it more difficult to access appropriate vocabulary items during feedforward processing (Clark & Clark, 1977).

Degree of contextualization. The more decontextualized the topic being discussed, the more difficult it will be to select specific words during

discourse (Norris & Hoffman, 1993; Taylor, 1969). For instance, describing the parts of a computer that are visible and touchable, is an easier task than describing ideas for creating highly complex computer programs. Since the computer programs are only in the planning stage, and do not actually exist, appropriate word selection is difficult.

Familiarity. If a speaker is in the position of having to discuss an unfamiliar topic, he will experience more word selection difficulty than he would in familiar territory (Norris & Hoffman, 1993; Rapp & Carramazza, 1991). Suppose an experienced chef and a master auto mechanic could each discuss his own profession relatively fluently. If the two found themselves pressed into detailed conversation on the opposite occupation, word selection would be more of an effort, and therefore a more difficult task.

Internal states. On-line word selection can be disrupted by internal factors like fatigue, stress, anxiety, and strong experiences of emotion such as embarrassment, fear, and anger (Clark & Clark, 1977; Kremin, 1988). When a speaker is tired or nervous, her feedforward processing becomes less efficient. Even the most fluent speaker may have difficulty with word selection when she is telling a highway patrolman exactly why she was speeding!

Social factors. Whether engaged in a monologue or dialogue, it is important for a speaker to let his listeners know if he has more to say or if he is finished (Clark & Clark, 1977). Long silent pauses may give listeners the impression that it is their turn to speak. This puts pressure on the speaker to keep his discourse moving, and thereby lessens word selection time, making the process more difficult.

Varieties of Word Selection Problems

The behaviors under study include several different types of discourse disruptions and patterns of word use that have been related to the processes of on-line discourse structuring and word selection. Among the authors who have categorized these behaviors are Clark and Clark (1977), Dollaghan and Campbell (1992), Evans (1985), German and Simon, 1991, and Wiig and Semel, (1984). Eight behaviors that are common to these classification systems (although terminology usually differs) are described below, and summarized with examples in Table 1.

Reformulations. Reformulations, also termed false starts (Clark & Clark, 1977), occur when a speaker begins a communication unit, then stops and reworks his message, either to repair an error, to add clarifying information, or to delete unnecessary or ambiguous information (Dollaghan & Campbell, 1992). Discourse that contains a number of reformulations occurring in succession, creating

Table 1

Discourse Nonfluencies Related to Word Selection

<u>Nonfluency</u>	<u>Operational Definition</u>	<u>Example</u>
Reformulation	Speaker begins a message, then stops and reworks the message.	"She's/she she used to ring a bell."
Repetition	Speaker duplicates any linguistic unit.	"She/she used to ring a bell/a bell."
Interjection	Speaker produces words or phrases that do not add to the content of an utterance.	"She used to ring, well, a bell."
Revision	Speaker produces one term, then immediately replaces it with another word or phrase.	"She had a ringer/a bell."
Substitution	Speaker produces a word or phrase that is related to, or describes, the target word.	"She always had that clanger."

(table cont'd)

Indefinite Reference	Speaker produces a non-specific word instead of the target word.	"She rang that thing."
Explanation	Speaker comments on his own nonfluency.	"She rang... I forgot what it's called."
Delay	Speaker pauses during discourse; can be (a) filled, or (b) unfilled.	(a) "She was ringing the um, uh, bell." (b) "She was ringing the... bell."

an extreme hardship for listeners, has been further described as maze behavior (Loban, 1976). It should be noted that dialectal variations like pronoun appositions (e.g., Elaine, she went to the store.) are not considered reformulations (German, 1991).

Repetitions. Repetitions occur when a speaker produces duplications of any linguistic unit without making changes. Of course, if the unit is repeated purposefully, for emphasis, the behavior is not considered a disruption (e.g., They have a big, big, big pool.).

Interjections. Words or phrases that add no content to an utterance, but act as subtle signals as to why a speaker has to interrupt his discourse, are called interjections (Clark & Clark, 1977). Words like oh and well, and phrases like let's see and you know are often produced in discourse, generally just prior to the production of a particular referent.

Revisions. Revisions, or self-corrections, occur when a speaker selects and produces one term, then immediately replaces it with another word or phrase. Through this editing process, the speaker can correct overt mistakes in word selection. She can also switch to a term that more precisely conveys her meaning (Clark & Clark, 1977; Wiig & Semel, 1984).

Substitutions. When a speaker uses a word or phrase that is semantically, phonologically, or perceptually

related to his target word, he creates a substitution (German, 1991; Wiig & Semel, 1984). Substitutions may not always cause breaks in discourse fluency, but they do place a burden on a listener who expects to hear the target word. Speakers use substitutions if they have not learned the name of something (e.g., an object, agent, action, or attribute), or if, for some reason, they are unable to retrieve that term during feedforward.

Indefinite references. Indefinite references occur when a target word is replaced with a nonspecific term (Wiig & Semel, 1984). This behavior causes serious problems for a listener, who is left to infer the target word from context. If a speaker uses the word thing to refer to an item not present in his environment (i.e., he can't point to it), he is producing an indefinite reference. Pronouns for which no referent has been established also belong in the category of indefinite references.

Explanations. When a speaker interrupts his discourse, she sometimes comments on why she is doing so. Explanations can act as signals that a revision is about to occur (Clark & Clark, 1977). They can also be references to language or thought processes (e.g., "I can't remember what it's called.") (German, 1991). Authors have discussed

explanations using different terms, including parenthetical remarks (Kowal, O'Connell & Sabin, 1975), and insertions (German, 1991).

Delays. The category of delays includes filled and unfilled pauses. Filled pauses are defined as gaps in discourse that are filled with segments like uh, um, er, and mm. Unfilled pauses are silent hesitations during which planning for word selection can occur (Clark & Clark, 1977).

Normal Development

Normally developing children acquire word selection proficiency as their whole language systems become refined (Evans, 1985; Norris & Hoffman, 1993; Wiegel-Crump & Dennis, 1986). During language development, children's discourse is typically characterized by a number of pauses, repetitions, and reformulations as they hone their ability to anticipate and plan what they are going to say, taking into consideration the message they wish to convey, what they have previously said, and the present situational context (Evans, 1985). Studies of word selection under various laboratory task constraints have shown that normal children up to the age of about 10 to 12 years show a gradual increase in word selection (i.e., naming) accuracy, rate, and general discourse fluency (Wiegel-Crump & Dennis, 1986; Wiig, Semel and Nystrom, 1982). By the age of about

10 years, 6 months, normally developing children demonstrate levels of word selection proficiency that are within the adult range (Goodglass, 1980a; Nelson, 1979).

Although children gradually become faster and better at selecting the words they need, there is evidence that the improvement does not occur in a simple linear fashion. Evans (1985) studied discourse disruptions in normally developing children through observation of kindergarten and second grade students during classroom "Show and Tell". This activity allowed children to speak naturally and at length about their own possessions, observations, and experiences. Evans found that the second graders interrupted and corrected their own discourse over twice as often as the kindergarteners did (19% and 7% of the utterances, respectively). She observed that the second graders may have been less fluent because they attempted more complex narratives, used more elaborate vocabulary, and, presumably, had developed better self-monitoring skills (Evans, 1985). It is possible that developing children experience many peaks in their production of discourse disruptions, occurring each time they respond to a need to use language in more complex ways.

There is also evidence that as children develop, they replace the more disruptive types of overt word selection behaviors with more sophisticated types. Kowal, O'Connell, and Sabln (1975) looked at speech discontinuities (i.e.,

filled and unfilled pauses, repeats, false starts, and parenthetical remarks) in the discourse of 168 normal children at seven different age levels from kindergarten through twelfth grade. The subjects were given nine pictures from a "Snoopy" cartoon, asked to arrange the pictures so that they could tell a good story, and then to tell their story. Kowal, et al. found that older children produced many fewer false starts and repetitions than younger children did. Unfilled pauses were also fewer and shorter in older subjects, and consequently, their rate of speech was faster. In the category of parenthetical remarks (e.g., "well," "you know," "I mean"), however, older subjects demonstrated considerable more occurrences than younger ones. Starkweather (1987) suggested that this was because older subjects were demonstrating their experience with discourse production by skillfully using parenthetical remarks to gain extra planning time to think of the words they would need next.

Word Selection Behavior in LLD Children

Contrasts with Normally Developing Children

Several investigators have hypothesized that children with LLD are less proficient at on-line word selection than their normally developing peers. Studies have shown that LLD students demonstrate a significant number of hesitations and other nonfluencies related to word

selection (Denckla & Rudel, 1976a; Fried-Oken, 1982, 1983 in Wiig & Becker-Caplan, 1984; German, 1979, 1982, 1987; German & Simon, 1991; Goldman-Eisler, 1958; Leonard, Nippold, Kale & Hale, 1983; Loban, 1963; McLachlan & Chapman, 1988; Murphy, Pollatsek & Well, 1988; Wiig & Becker-Caplan, 1984; Wiig, Lapointe & Semel, 1977; Wiig, Semel & Nystrom, 1982). These authors believe that LLD students are at a great disadvantage every time their classroom teachers ask a question.

Some important observations about the word selection behavior of LLD students have been discussed in the literature. First, most researchers have concluded that any difficulty an LLD child may experience with word selection is but one aspect of a more encompassing language deficit. Secondly, data show that the types of hesitations and speech errors in the discourse of children with LLD are more similar to those produced by normally developing children and normal adults than they are to those produced by neurologically impaired individuals (Goodglass, 1980a; McLachlan & Chapman, 1988). Thirdly, the real difference between LLD children and their normal peers appears to lie in the quantity of discourse disruptions (Damico, 1985; German, 1991; McLachlan & Chapman, 1988). Lastly, it has been suggested that task complexity may affect the fluency of LLD speakers even more than it does normal speakers (McLachlan & Chapman, 1988).

Quantitative Differences

Since normal adult speakers sometimes encounter word selection problems during discourse, and normally developing children exhibit considerable on-line word selection difficulty at times, investigators have wondered if the word selection behavior of LLD children was really measurably different. There is evidence to support claims that LLD children hesitate more often and produce many more discourse disruptions than normally developing children, and that these disruptions are often related to the selection of words.

Murphy et al. (1988) looked at the word selection behaviors of dyslexic and normal, 10 to 11 year old children using single-word and discourse tasks. First, they compared subject groups using a battery of tasks that included two confrontation naming measures of word retrieval, the Boston Naming Test (Kaplan, Goodglass & Weintraub, 1983), and an experimental task. The dyslexics averaged 14% more errors than the normal subjects on the Boston Naming Test utilizing singly presented line drawings. The experimental naming task involved four charts, each with 21 line drawings of tools, furniture, musical instruments, body parts, vehicles and clothing. The dyslexic subjects produced a mean of 81% more naming errors on this task than the normals did. The dyslexics also hesitated more on both tasks; they were 39% slower to

name pictures. No explanation was given for the large difference in the mean error percentages between the Boston and the experimental task, but it seems likely that there were important differences in task complexity.

To show that the word selection difficulties of the dyslexic subjects were not confined to confrontation naming, Murphy et al. (1988) utilized a story-retelling task. Subjects were informed beforehand that they would be giving an immediate retelling of a story, and asked to pretend to tell it to a friend who had never heard it. The authors reported that the dyslexics, on average, were 34% slower and recalled 32% fewer propositions than the normal readers. Unfortunately, no individual measures of the occurrence of specific word selection behaviors were reported.

More support for the existence of a quantitative difference in word selection behavior comes from a series of studies of children's word finding conducted by German (1979, 1982, 1983, 1986, 1987, 1991, German & Simon, 1991). German (1987) compared 28 language disordered children, aged 7;0 to 12;0, with normal controls matched for chronological age, socioeconomic level, performance on a receptive vocabulary test, and performance on an intelligence test. A picture description task (i.e. telling a story about a black and white action picture) was used. Results indicated that although the same types of

behaviors were produced by both groups, the discourse of the language disordered subjects contained significantly more behaviors characteristic of word selection difficulty (e.g., delays, repetitions, substitutions, time fillers, "empty" words). German and Simon (1991) compared groups of 16 normal and language disordered children, aged 7;0 to 12;0, matched for the above variables plus sex, grade, ethnicity, and geographic region (German & Simon, 1991). Subjects were asked to tell stories about three action pictures. Examiners used specific probes to encourage subjects to extend their narratives (e.g. "Explain how the picture would be different if it were snowing."). The authors concluded, as in the earlier study, that verbal repair behaviors associated with word selection occurred significantly more frequently in the discourse of the language disordered children.

In 1991, German published a standardized measure, the Test of Word Finding in Discourse (TWFD). A sample of 856 normal children aged 6;6 to 12;0, representing four geographic regions of the United States, served as the national standardization group. For construct validity purposes, a comparative sample of 43 children with identified word finding problems was selected and studied along with 43 normal children from the standardization group who were matched for race, ethnicity, parent's education level and geographic region.

The stimulus items of the TWFD were line drawn action pictures. These drawings were primarily black and white, but color was used to highlight certain concrete objects. Subjects were asked to tell a story about each picture, and to describe the characters' actions. According to TWFD instructions, if a subject spontaneously switched to a different topic, she was not to be discouraged, and the discourse produced was considered acceptable for TWFD analysis. Specific probes were provided to aid in eliciting further discourse about each picture.

Both groups exhibited the same types of discourse interruptions, but the mean percentage of T-units containing one or more problematic word finding behaviors was 43.1% for the word finding group, and 18.1% for the normally developing group. German also compared the mean percentages of T-units containing each of seven problematic word-finding behaviors; the group mean for the word finding group was significantly higher than that of the normally developing group in all seven behavioral categories.

Two problems with the German studies are important to note. One is that language disordered subjects were never compared with younger normal controls matched for oral language ability (but see Plante, Swisher, Kiernan & Restrepo, 1993, for concerns about language level matching). Another is that there has been no reference to the effects of differences in the complexity of various

experimental discourse tasks. These omissions leave room for certain questions. The quantitative differences may have been present because the normal subjects had developed more discourse flexibility and were more proficient at on-line word selection than language disordered children of the same age. A comparison of language matched normals using language in similar, less flexible ways may not have shown differences in "word finding" measures.

Differences in Word Selection Proficiency When Discourse Complexity is Increased

MacLachlan & Chapman (1988) studied the relationship between word finding difficulty and discourse complexity. They studied a group of seven LLD children between the ages of 9;10 and 11;1, along with a group of normally developing children matched for chronological age, and a group of younger normals (aged 3;7 to 5;8) matched for mean length of communication unit in conversation. Two discourse tasks were presented. The first was conversational dialogue with the examiner on familiar topics. The second task was to retell an episode of a favorite television program of each subject's choice.

Results of the conversation task revealed similar levels of discourse nonfluency for all groups, and all groups showed higher levels of word selection difficulty on the narrative task. There were no differences among groups in the types of nonfluencies produced. Longer

communication units yielded more nonfluencies for all groups across both tasks. The significant finding was that the LLD group exhibited significantly greater levels of discourse interruptions related to word selection only in the narrative condition. MacLachlan & Chapman concluded that an increase in the complexity of the discourse in a task affects LLD children's discourse fluency significantly more than chronological age matched peers or linguistic level matched peers.

Word Selection Characteristics of LLD Children Contrasted with the Naming Behaviors of Adult Aphasics with Focal Lesions

The word selection characteristics of LLD children have been differentiated from those of normal children by quantity and by their more dramatic increase with increased discourse complexity. It is also necessary to discuss the qualitative differences between the word selection behaviors of LLD children and adult aphasics with focal lesions. Many authors interested in child language have discussed the two populations as if the typical behaviors related to word selection were similar. This may mislead readers, because it creates the impression that LLD children have sustained neurological damage and might benefit from intervention programs designed for the aphasic population. There are, in fact, behavioral similarities with regard to word selection, but it can be demonstrated

that LLD children behave much more like normal speakers than aphasic speakers with focal lesions.

The various types of disruptions found in the discourse of LLD children are the same types produced by normal speakers. Classification systems that have been developed specifically for the word selection behaviors of LLD children (e.g., Fried-Oken, 1982, 1983 in Wiig & Becker-Caplan, 1984; German, 1991; Wiig & Semel, 1984) and those developed for the discourse nonfluencies of normal speakers (e.g. Clark & Clark, 1977; Dollaghan & Campbell, 1992; Evans, 1985) contain virtually the same categories. Classification systems designed for the word selection behaviors of aphasics (e.g. Buckingham, 1979; Goodglass, 1980a; Kremin, 1988) contain two additional categories that have not been reported as occurring with any frequency in normal speakers or LLD children. Unrelated, or "asemantic" lexical errors are meaningless words in the speaker's present context and offer the typical listener no context clues with which to infer intended messages. Neologisms are not even recognizable as words in the language. If normal or LLD speakers do inadvertently produce such errors (e.g., slips of the tongue), they are quickly repaired (Goodglass, 1980a; Wiig, 1989). Conversely, aphasic speakers with focal lesions may produce such errors every time they attempt to speak, and may be unable to successfully execute repairs (Goodglass, 1980a).

Repair behavior is another area in which normal and LLD speakers differ from aphasic speakers with focal lesions. Normal and LLD speakers tend to consistently recognize and repair word selection substitution errors (Clark & Clark, 1977; Evans, 1985; Wiig, 1989). Aphasic speakers with focal lesions are different. They may or may not have the ability to monitor their own discourse for lexical errors. When they do detect errors, aphasics often persist in unsuccessful attempts to retrieve target words, and are ultimately unable to make repairs (Goodglass, 1980a).

Other word selection behaviors are found exclusively in aphasic speakers with focal lesions. They have been observed to have difficulty retrieving lexical items from some semantic categories and not others (e.g. objects but not colors), and to be able to write certain words but not say them (Goodglass, 1980; Rapp & Carramazza, 1991). These behaviors serve to further differentiate the normal and LLD populations from this portion of the adult aphasic population.

Theoretical Considerations

Word Selection Models

Many complex models have been constructed to describe the cognitive components and processes required for word retrieval during language production (Anderson, 1972, in

Caplan, 1987; Collins & Loftus, 1975; Forster, 1976; Morton, 1970; Norris, 1982; Rapp & Carramazza, 1991; Shallice, 1988; Wolf, 1980). All of these models incorporate two constructs, some type of storage system(s) for learned information, and routes of access in and out of the storage system. From these conceptualizations of normal cognitive-linguistic functioning, researchers have hypothesized that word selection difficulties must stem from a storage problem, or an access problem, or an interaction of both (Leonard, Nippold, Kall & Hale, 1983; McGregor & Leonard, 1989; Shallice, 1988; Warrington & Shallice, 1979; Willg & Becker-Caplan, 1984).

Storage

Storage for words refers to the process by which a concept and its attached word(s) are learned, reserved or "banked" for future use. This storage system is often conceptualized as an elaborate, multi-level matrix of semantic entries. Some researchers have hypothesized that LLD children may have difficulty with word selection because terms are not sufficiently grounded in their storage system, or are represented less elaborately than they should be (Casby, 1992; McGregor & Leonard, 1989; Willg & Becker-Caplan, 1984). The important point here is that certain words have been "learned" to some degree, but without the elaborate network of associations acquired by normally developing children. While children with such

poorly established word representations may be able to recognize certain words spoken in context, they may have difficulty producing the identical words in response to directed naming tasks with picture stimuli. The process of selecting precise words during discourse, especially when the language is decontextualized, is likely to be even more difficult (Norris & Hoffman, 1993). Added demands like time constraints and responding before a group can only compound the problem. Additionally, due to the superficial, "disconnected" nature of the word representations, semantic cues may not always facilitate immediate word production (Shallice, 1988; Warrington & Shallice, 1979).

Access

Access refers to the process by which the appropriate word is retrieved from the storage system. Some researchers believe that LLD children may use less efficient access strategies than their normal peers (McGregor & Leonard, 1989; Willig & Becker-Caplan, 1984; Willig & Semel, 1984). A child with ineffective access abilities may have inconsistent difficulty producing stored words during all types of discourse tasks, although various types of primes are likely to elicit retrieval (Shallice, 1988; Warrington & Shallice, 1979). When feedback is unavailable, as when speaking before a classroom group, the linguistic output can contain so many interruptions and

repairs that it becomes unacceptable to listeners (Evans, 1985).

Applications of Word Selection Models

Recently, German (1991, 1992) has argued that there are three subgroups within the LLD population: a poor retrieval subgroup, a poor storage subgroup, and a subgroup with limitations in both areas. The poor retrieval subgroup is said to be characterized by word selection difficulties coupled with "good understanding of language" (1992, p. 36). These children exhibit the hesitations and other behaviors associated with word selection problems, even when they can identify their target words easily on picture vocabulary tests. The poor storage subgroup contains students with documented language comprehension problems who exhibit difficulty finding "words they do not know" (1992, p. 38), and words that are not firmly grounded in memory. They reportedly do not exhibit excessive word selection difficulty on words with which they are familiar. Members of the subgroup with limitations in both areas are characterized by poor language comprehension and difficulty retrieving known words (German, 1992). These children are said to have blatant, easily identifiable problems in both storage and access.

The practice of grouping LLD children by their word selection behaviors may be inappropriate. It seems probable that the children in the poor retrieval subgroup

are manifesting more than a pure retrieval deficit. Their adequate performance on picture vocabulary tests may not give a true picture of their language comprehension or their elaborated word knowledge. The findings that these children are often not effective readers or speakers adds to the suspicion that their language problems extend far beyond word retrieval (Damico, 1985; German & Simon, 1991; McGregor & Leonard, 1989; Murphy, et al., 1988). Regarding the poor storage subgroup, it is easy to accept the notion that poor word knowledge could be manifested in the form of hesitations and discourse interruptions. It seems, however, that an access component must also fit into the equation. By definition, these children have word knowledge that is not well developed enough to allow them to use various retrieval strategies (e.g. Wllg & Becker-Caplan, 1984). It seems likely that children in both the poor retrieval subgroup and the poor storage subgroup are demonstrating the combined effects of inadequate elaboration and ineffective access.

It is hypothesized that German's three subgroups may simply reflect different severity levels of the same underlying language deficit. Perhaps students in the poor retrieval subgroup have the subtle sort of language differences that are difficult to measure with conventional tests (Damico, 1985), while those in the poor storage subgroup can be identified somewhat more readily. The

third subgroup must belong to those students whose academic functioning and performance on various measures of linguistic proficiency is well below par (Kail, et al., 1984).

Although for some time various researchers maintained one theoretical position or the other, accumulating evidence has made it increasingly more difficult for each to ignore the other. Some reports have supported the idea that the problem could be attributed to an interaction of both access and storage (Kail & Leonard, 1986; McGregor & Leonard, 1989; Nippold, 1992; Wing, 1990). Kail & Leonard (1986) reported that all of their subjects had elaboration problems, and that none of them presented an exclusive retrieval deficit. The few children in this study who did appear lacking in access strategies were also deficient in elaboration. With this in mind, McGregor and Leonard (1989) set out to assess the utility of elaboration and retrieval treatment activities. Data from their treatment study showed that their subjects improved most when exposed to elaboration plus retrieval training compared to exclusive elaboration treatment or retrieval treatment. Similarly, Wing (1990) compared two treatments. One treatment focused exclusively on storage/elaboration and the other on access/retrieval. Results showed a degree of improvement in both groups.

A Possible Interaction Between Storage and Access

Theoretical models from the disciplines of neurolinguistics and cognitive science may explain the interaction between access and storage (Anderson, 1972, in Caplan, 1987; Caplan, 1987; Hebb, 1949). Consider a lexical system in which each word representation is "stored" through the activation of a specific neuron group, and "accessed" by precise activity in a group of adjacent neurons (Caplan, 1987). In such a system, each new association between lexical items would cause activity in both neuron groups. Frequent activation and interplay between the groups would increase the probability that the access neurons would activate the storage neurons (Hebb, 1949). Word representations that have been stored with an elaborate network of associations, and have been accessed often, have a high probability of being accessed in the future. Conversely, word representations that have been stored superficially, with few associations and few instances of access, have a lower probability of future access. If the lexical system is conceptualized in this way, the notions of storage and access are inseparable.

The writings of language development theoreticians Eve Clark and Katherine Nelson also shed light on storage and access as intertwined processes. Clark has proposed the Principle of Contrast in which every two forms in a language contrast in meaning. Although the stored meanings

of words may overlap, there are no true synonyms (Clark, 1987, 1988, 1990). It is up to speakers to select words that match their intended meanings most exactly. If the language offers a set of words that mean almost the same thing, a speaker must choose the appropriate one based on the formality of the situation, the background of the listeners, and the connotation desired (Clark, 1987). In many instances, LLD students will not have stored vital information on the subtle differences among apparent synonyms. They will then lack the necessary linguistic flexibility to access appropriate word choices rapidly and effectively (Norris & Hoffman, 1993; Wiig, 1989). The result is an unacceptable level of discourse nonfluency in the form of revisions, hesitations, substitutions and other interruptive behaviors.

Clark (1987) has also demonstrated that speakers will create novel words when they have not stored, or cannot access, the established forms for specific meanings they wish to convey. LLD students tend to coin new terms frequently. They often combine familiar words (i.e., words that have many associations and have been accessed often) to replace words that already have established meanings in the language, as with high ride for roller coaster or bookholder for shelf (German, 1991; Wiig & Becker-Caplan, 1984). The problem with this behavior is that listeners have difficulty accepting innovative terms in place of the

conventional forms they have come to expect (Clark, 1987). The burden of constantly inferring established forms from innovative forms becomes great, sometimes causing listeners to lose patience and end the interaction.

Nelson (1991) described the process involved in storing word representation information as follows. For each new word, individuals must store phonological information, information on how it may be used in discourse, semantic information, and information on the word's relationships with other forms in the language. This information can be acquired in a piecemeal fashion, in no particular order, with the entire process taking years for each word. Words that are relatively far along in this information storage process can generally be accessed for production. The LLD students' delay in this process puts them in situations in which they may be expected to use certain terms in discourse before they have stored enough vital information. This can result in several of the aforementioned behaviors associated with word selection processing. Take, for example, the substitutions of "Mapachusa" for Massachusetts, and "partant" for important. The LLD students who used these forms may have been required to access these words before storage of phonological information had been completed.

These findings serve to further the argument that storage and access problems go hand in hand in the LLD

population. In order to improve word selection proficiency, and thereby enhance discourse fluency, it seems that treatment should address both aspects of language processing.

Intervention Options

Intervention approaches targeting the word selection problems of children with LLD have typically incorporated activities meant to facilitate word elaboration or word accessing strategies (German, 1982, 1992; German & Simon, 1991; Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984). Several researchers have developed treatment protocols and performed efficacy experiments (Casby, 1992; McGregor & Leonard 1989; Wing, 1990). The first portion of this section will compare the various treatment suggestions. The second section will describe the experimental treatment protocols.

Suggested Treatment Strategies

Wiig. Wiig and her colleagues have advised that before planning treatment, clinicians should carefully consider their own philosophies of why LLD students demonstrate word selection problems (Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984). They stress that intervention procedures for individual LLD children should be age appropriate and based on the outcome of traditional assessment procedures such as word definition, word

grouping, and word association tasks. According to Wiig & Becker-Caplan, it is quite likely that storage/elaboration deficits will be present (1984). In this case, the objective for intervention would be to facilitate development of a more organized lexical storage system. Suggested treatment strategies include (a) helping students identify and expand their understanding of word meanings, (b) training students to categorize words according to semantic class, and to identify the common features of each class, and (c) facilitating students' understanding of how related words are alike and different. Games like "Twenty Questions" and "Concentration", as well as open-ended riddles, are suggested as appropriate formats for treatment (Wiig & Becker-Caplan, 1984; Wiig & Semel, 1984).

Additional procedures have been suggested by Wiig and her colleagues for use in the event that a child is judged to have a retrieval deficit. In this case, the management objective would be to increase and add flexibility to the child's repertoire of usable access strategies (Wiig & Becker-Caplan, 1984). A number of these strategies are recommended, including (a) using motor movements to aid in the retrieval action words, (b) using detailed scripts with chained cause and effect sequences, (c) using semantic hierarchies, and (d) using visual imagery. Finally, the use of behavior modification techniques to decrease

habitual patterns of poor fluency is suggested (Wlig & Becker-Caplan, 1984).

German. German (1992) published a detailed outline of her Word-Finding Intervention Program (WFIP), a multi-principle outline for treating the word selection difficulties found in children and adolescents. Like Wlig and her co-authors, German suggested that the first step should be to identify the source of each child's word-finding problem (i.e., poor access, poor storage, or poor access and storage), so that intervention might be tailored accordingly. She advised that intervention should encompass several aspects, including the remediation of retrieval skills, the reduction of oral language demands in the environment, and the development of self-advocacy techniques (German, 1992). In addition, German (1992) advised clinicians to provide individual and group instruction in a variety of physical settings.

In terms of treatment, German presented some ideas that were similar to those of Wlig and colleagues. Clinicians were advised to teach certain cuing strategies meant to facilitate quick and accurate word retrieval (e.g., phonemic, graphemic, semantic, and gestural cues). The program also advocated the teaching of circumvention techniques for dealing with word-finding "blocks"; these included using synonyms, superordinate terms and functional descriptions in place of target words. German felt that

some students should be trained to use self-imposed pauses to provide themselves with additional retrieval time. For certain students who manifest difficulty accessing phonological information, German suggested pure rehearsal followed by combined rhythm and rehearsal (i.e., hand tapping), word segmentation and rehearsal (i.e., drawing lines between syllables of the written word), and rapid naming (German, 1992). German reported that the above activities should be applied to vocabulary lists comprised of words with which the student has experienced past difficulty, words from curriculum materials and words that might be used in daily living contexts. It was also suggested that intervention should follow traditional progression from single words to connected speech, with continuing rehearsal of selected words in isolation and in linguistic structures of increasing length, and, finally, generalization activities (German, 1992).

No efficacy testing has been reported on the treatment suggestions set forth by German (1992), Wiig and Becker-Caplan (1984), and Wiig and Semel (1984). However, three relatively recent studies have assessed the efficacy of similar practices in experimental treatment protocols (Casby, 1992; McGregor & Leonard, 1989; Wing, 1990).

Previous Treatment Studies

Casby. Casby (1992) reported results of a treatment study evaluating an approach he used for an 11-year old boy

who had a language disability and naming problems secondary to early neurological damage. This subject was actually not a member of the developmental LLD population being discussed here, but Casby based his research primarily on literature written about LLD children, and his treatment was intended for use with LLD children.

Casby (1992) introduced his approach with the hypothesis that the naming problems (his preferred term) of LLD children are due to underdeveloped, unelaborated semantic entries. He cited the work of Craik and Lockhart (1972), who proposed a model for semantic memory with three levels for processing new words; these levels ranged from "shallow" to "deep". Shallow processing tasks were at the phonological level and included (a) producing rhyming words, and (b) deciding whether or not a given word rhymed with a target word. Another, less shallow level of processing was comprised of categorization tasks. The tasks given to exemplify the deep level of processing were semantically oriented, including (a) producing sentences using stimulus words and (b) deciding if stimulus words could fill in parts of given sentences. Casby went on to emphasize that when a stimulus is processed at a deep level, it becomes more elaborate, richer, more durable and longer-lasting (Casby, 1992).

Treatment stimuli included two sets of 15 color pictures that the researcher chose according to three

criteria: (1) must be picturable nouns; (2) must occur with low frequency in the language (presumably, because the subject had great difficulty recalling words that he used infrequently); and (3) subject must comprehend picture name and label it in pretesting. The investigator conducted timed baseline measurements of the subject successively naming each stimulus picture in both sets. Treatment was formatted as a three-part delayed recall task. In phase one, the child was shown one picture at a time to name and tell something about (e.g., "Rowboat. You ride in water in it."); this activity was thought to bring about deep elaborative processing of a word's paradigmatic (i.e., conceptual/categorical) characteristics. A set of pictures was then arranged face down on a table, and the subject was required to choose any two pictures and use both labels together in a sentence; this activity was said to stress the deep elaborative processing of the words' syntagmatic (i.e., syntactic/relational) characteristics. In phase two, a delay was imposed by required the subject to converse with the examiner for five minutes about topics unrelated to phase one activities. Phase three consisted of two timed naming trials for each stimulus set. Baseline and treatment occurred across a total of 15 sessions.

Casby (1992) found that naming time decreased and naming accuracy increased for the stimuli used. He quickly cautioned the reader, however, that his results were

preliminary, and not without problems. One major drawback he noted was that the treatment only affected those words included in the study and there was a lack of generalization to untrained words. The author explained that if the child's problem had been due to inefficient retrieval, treatment would have been expected to yield better naming across a larger group of words; this claim is somewhat confusing, as retrieval was not directly addressed in intervention. If, as he thought probable in this case, the word-finding problem was due to impaired lexical storage, Casby believed that less generalization was to be expected (Casby, 1992).

Another area of concern about Casby's treatment was the use of only picturable nouns as stimuli. This is certainly a way to help establish experimental reliability, but part of the challenge for children with LLD is that so many concepts are not concrete or picturable (Norris & Hoffman, 1993). For example, even the often asked story comprehension question, "How did the character feel?" requires an answer more complex than a simple object name (Blank, Rose, & Berlin, 1978).

A third area of concern was the contrived nature of the treatment activities and the unrelatedness of the stimulus items to any context, topic or each other. In view of the models of semantic organization cited earlier, which stressed some sort of interconnection between lexical

entries, this lack of connectedness seems inappropriate. Moreover, in all types of discourse, speakers are expected to monitor what they have already said, what they are about to say, and the situational context (Clark & Clark, 1977; Evans, 1985). It seems that if LLD children are to pursue improved word selection performance, they should be immersed in discourse production and encouraged to develop functional discourse schemata (Mandler, 1984; Norris & Hoffman, 1993).

A fourth questionable aspect of this treatment was the lack of meaningful interaction between the clinician and the student. If, as Casby says, LLD children would benefit from further elaboration of his lexical entries, it seems that adult input (and even peer collaboration) in the form of prompts to continue thinking and talking, examples, leading questions, and demonstrations would not only be desirable, but necessary (Vygotsky, 1956, in Wertsch, 1985). Vygotsky's acclaimed Zone of Proximal Development construct implies that learning can only occur within a certain range of conceptual difficulty that lies between a child's current independent performance level (as determined by having them solve problems without help), and their potential performance level (as determined through problem solving under adult guidance or in collaboration with more capable peers). In terms of normal language development, researchers have argued that children acquire

monitoring criteria via listener feedback (Clarke, 1978; Evans, 1985; Kasermann & Foppa, 1981). In view of this, it seems that LLD children should be able to improve their linguistic knowledge, and consequently their on-line word selection and repair performance, only through active and enriching interactions with adults and normally developing peers.

McGregor and Leonard. McGregor and Leonard (1989) described a treatment that they developed specifically for the LLD population. They studied four subjects, aged 9;1 to 10;5; two children received the experimental treatment, and two served as controls. All four children were described as having word-finding problems (their preferred term) evidenced by frequent circumlocutions and hesitations.

McGregor and Leonard (1989) presented a discussion of poor storage and poor access as sources of word-finding difficulty for LLD children. They felt it would be desirable to provide an appropriate balance of elaboration and retrieval activities in treatment, once they determined which type was most helpful to a particular child. They decided to test both types: a set of elaboration activities to provide subjects with new information about the target words, and a set of retrieval tasks to encourage subjects to self-cue using known information (e.g., superordinate category, initial phoneme, customary

location) to facilitate access (McGregor and Leonard, 1989).

Stimulus items included 120 (4 sets of 30 each) concrete, picturable nouns of intermediate frequency of occurrence, which all four children were able to identify on a comprehension task. All children were pre-tested on a timed picture-naming task and three free-recall tasks. This task involved naming as many pictures as possible after they had all been presented serially. The experimental treatment occurred across 12 one-hour sessions, with treatment activities and stimulus items counterbalanced across experimental subjects. The controls participated in an equal number of language therapy sessions which targeted narrative and syntactic skills, but which reportedly were unrelated to word-finding. The authors did not describe the activities involved in therapy sessions with the controls, nor did they explain why they chose narrative and syntactic skills as objectives.

The elaboration portion of the treatment incorporated three segments: (1) a phonemic segment, during which subjects heard and produced rhymes for the target words, and corrective feedback was provided when necessary, (2) a semantic segment, during which subjects saw, named and discussed exemplars from the same semantic category as each target word, and (3) another semantic segment, during which subjects discussed similarities and differences between

each target word and a comparison word. The retrieval portion of the treatment also incorporated three segments which involved (1) the presentation of isolated words, (2) the clinician's identification, description and demonstration of self-cuing strategies, and (3) attempts by the subjects to recall the target words using the self-cuing techniques. Three self-cuing strategies were used: knowledge of superordinate category, knowledge of initial phoneme, and knowledge of customary location of the object.

Results showed that the subjects involved in the experimental treatment had fewer naming errors on both a posttest and maintenance test; one of the controls showed a small reduction of errors, and one showed no change. Response latency actually increased for all four children, who, the authors realized, may have slowed their responses as a test-taking strategy to facilitate accuracy. On the free recall task, both children who received the treatment improved from pretest to post- and maintenance tests, one of the controls improved to a lesser degree, and one showed no change. When the authors looked for patterns in the data to differentiate effects of the elaboration treatment versus the retrieval treatment, they found fairly scattered scores, but concluded that it was possible to facilitate word-finding skills through clinical treatment, and that

both types of training together yielded the greatest improvement.

Like Casby (1992), McGregor and Leonard (1989) stressed the preliminary nature of their findings. In their discussion, they gave a comprehensive account of the confounding factors they encountered. One problem was their inability to keep elaboration and retrieval treatments totally separate, as was their intention. They found that it was possible for the subjects, once made aware of certain retrieval strategies, to apply them during tasks designed to focus on elaboration only. Secondly, they were uncertain as to the actual function of their retrieval treatment. Since subjects had to pass probes of prior conceptual knowledge (about a separate list of words) to be included in the study, the authors felt afterwards that the children may have already been using similar information about the target words to facilitate retrieval. A third concern was that the cuing techniques chosen for the study may not have been any more or less helpful than others they might have used (e.g., attempting to recall the number of syllables in a word, its function, or creating a mental picture of the actual item). A fourth point in their critique was that the group of target words selected may not have been particularly difficult for these subjects. Lastly, they believed it might be argued that

the subjects they selected were highly likely to have storage problems instead of access problems.

In addition to McGregor and Leonard's concerns, some of the questions raised about Casby's (1992) treatment can be applied here as well: (1) there was no indication of generalization to untrained words; (2) the stimulus items were all concrete, picturable nouns which were unrelated to any context, and (3) the tasks were not oriented toward natural language. It is also important to note that McGregor and Leonard's treatment incorporated somewhat more clinician-subject interaction than Casby's, but it was decontextualized, skill-based, and not at all like real language (Norris & Hoffman, 1993).

Wing. Wing's (1990) study also focused on storage and access as separate entities. She developed two different treatments for the word-finding problems (her preferred term) of children with LLD. Ten children with diagnosed LLD, aged 5;11 to 7;1, participated in the study. It should be noted that these subjects were several years younger than those who participated in the two studies described above. The ten children were divided into two equal groups matched for sex, age, race and score on the Test of Word Finding (TWF) (German, 1986). One group received a semantic treatment while the other group received a phonological and perceptual treatment (both treatments are described below). Treatment was

administered by the author across 30 sessions of 25 minutes each, and training vocabulary was said to be appropriate for six year olds without duplicating any words from the TWF.

The semantic treatment focused on elaboration/storage aspects. Using various sets of picture cards, the author taught the children to categorize, name a string of items from a given category, to describe objects/animals, to utilize categorical information and descriptive attributes to define words, to associate pictures of related objects, and to explain associations verbally. The phonological and perceptual treatment had two segments: (1) phonological segmentation activities, which were intended to facilitate retrieval of target words when only one or two phonological aspects of phonological information could be retrieved initially (Wing, 1990; see also Brown & McNeill, 1966); tasks included picture naming, separating names into syllables, counting syllables and rhyming words; and (2) imagery activities, which were meant to facilitate the integration of visual and auditory information with related stored information so that verbal labels (i.e. "auditory images) might be accessed effectively (Wing, 1990,); tasks included forming visual and auditory images of a pictured object presented and labeled by the clinician. In addition to these activities, in the final ten sessions of the

experiment the subjects participated in a guessing game intended to simulate the retrieval process.

Members of both groups, with one exception, improved their TWF raw scores from pretest to posttest, indicating some generalization of skills to untrained words. The average improvement of the phonological group was 39% (range 6% to 106%), significantly higher than the mean improvement of the semantic group, which was 20% (range -12% to 39%). There was one child in the semantic group whose posttest score was, for some reason, six points lower than pretest, and had his score not been included in the calculation of the mean, that group's average improvement would have been 28%.

It is important to note that Wing's experimental treatment phase extended across twice as many sessions as in the studies by Casby (1992) or McGregor & Leonard (1989); this could have contributed to her results. This study should also be evaluated in light of the questions raised about the two previous reports. With this treatment, there was some evidence of generalization to untrained words. There also appeared to be more clinician-subject and subject-subject interaction in the form of corrective feedback, explanations, and problem solving. The stimulus items, as in the other two studies, were noun picture cards (specific vocabulary items were not reported), but the various relationships between the items

were discussed more in this treatment than in the others. It is difficult to tell whether it was the actual treatment, the clinician's style, or a combination of both that caused the improvement and generalization.

Summary

Those who speak fluently may be perceived as more intelligent than those who frequently hesitate and self-correct as they attempt to select specific vocabulary during discourse. Normal speakers sometimes experience word selection difficulty, especially when engaged in complex, decontextualized linguistic tasks.

Normally developing children gradually acquire more efficient word selection skills. They produce fewer disruptive word selection behaviors. In addition, they learn to skillfully and inconspicuously use empty words to gain planning time.

Children with LLD exhibit many more overt word selection behaviors than their normal peers. Increased linguistic task complexity yields significantly more nonfluencies in the discourse of LLD students when compared to normals. Nonetheless, the word selection behaviors of children with LLD are more similar to those of normally developing children than those of adult aphasics.

Theoretical models of word selection processing include the constructs of storage and access. It is

possible that there is extensive interaction between storage and access systems.

Some approaches to intervention for children's word selection difficulties have been suggested, and a few have been tested for efficacy. These treatments place heavy emphasis on the remediation of naming skills, and concrete, picturable nouns are often used as training exemplars. None of the previous treatments have resulted in generalization to on-line word selection.

After reviewing the relevant literature, it is hypothesized that the word selection difficulties of LLD students may be addressed more effectively as they are engaged in discourse tasks. A question emerges: (1) Will discourse-based intervention strategies increase word selection proficiency and improve discourse fluency?

METHOD

The effectiveness of discourse-based intervention was studied using a within-subject multiple baseline across tasks design, as described by Barlow and Hersen (1984). This single subject design (replicated with three individual subjects) was chosen in order to avoid the problems caused by group heterogeneity in the LLD population. It is believed that if such students are grouped for research purposes, and results are averaged, the investigations may yield incorrect conclusions (Barlow & Hersen, 1984; Rapp & Carramazza, 1991).

This particular design was considered best for two reasons. First, the experimental intervention plan included procedures and strategies that were expected to result in relatively permanent performance changes. Because of this, neither true withdrawal nor reversal of treatment (a common component of many single subject designs) was considered practical (Barlow and Hersen, 1984). Secondly, the design allowed the use of tasks that closely approximated natural discourse, so that concurrent discourse behaviors could be examined and subsequently analyzed for covariation.

For the purposes of this investigation, an across-tasks variation of the multiple baseline strategy was chosen. Sequential application of the experimental

treatment across three distinct discourse tasks, namely picture-elicited narratives, story-retelling narratives, and conversations was used. According to this strategy, initial baseline measures are established under a variety of task conditions. Next, treatment is applied during one task only, while the baseline phases for remaining tasks are extended across a pre-determined number of sessions. Treatment is then applied during a second task, and this sequence is continued until treatment has been administered under all task conditions.

Treatment effectiveness was evaluated based on changes in the rate of occurrence of target behaviors (in this case, overt word selection behaviors). Within such designs, a treatment variable can be considered effective if (1) a change in the rate of occurrence of a targeted behavior appears soon after its application, and (2) the rate of occurrence of the target behavior during untreated tasks remains relatively constant (Barlow and Hersen, 1984). Several comparisons are possible with this design. First, any baseline phase can be compared to an adjacent treatment phase. Upward or downward shifts in the level of occurrence of a target behavior from baseline to treatment would indicate an effective treatment. Secondly, any treatment phase can be compared to the extended, untreated baseline of another task. If the level of occurrence of the target behavior decreases in the treatment phase, but remains fairly constant in the untreated baseline phase,

treatment efficacy can be supported. If target behaviors decrease in the untreated baseline phase, and there is a downward shift from the baseline, a case can be made for generalization of the treatment effect. A third comparison can be made from an initial, pre-treatment baseline to a post-treatment baseline after the withdrawal of treatment with an expected return toward the original baseline when the treatment is no longer in effect. Changes in the level of occurrence of target behaviors from baseline to baseline can be analyzed.

Subjects

Selection Criteria

Three white, male public school students aged 9;2, 9;6, and 9;10 were chosen to participate as subjects. Each participant had been previously evaluated by a team of school-based examiners, with resultant diagnoses of language-learning disorders that were not attributable to mental retardation, pervasive developmental disorder (e.g., autism) or hearing impairment. The students were enrolled in special education classes and were described by their classroom teachers as having word-finding problems. All subjects also met the following criteria. These tests were either administered by the experimenter or documented in review of case history:

1. Normal hearing, with pure tone thresholds below 25 dB across the frequencies 500, 1K, 2K and 4K; this measure

was taken to help rule out any possibility that the subjects' word selection difficulties were somehow related to hearing acuity problems;

2. No history of seizures, head trauma or documented neurological dysfunction; children with acquired neurological damage would constitute a distinctly separate population;

3. No history of a fluency disorder; this was to help rule out any possibility that a subject's word selection difficulties could be due to dysfluent speech production;

4. No documented anxiety disorder, which could interfere with discourse production due to excessive concern about linguistic competence, marked self-consciousness, marked feelings of tension, and/or inability to relax (American Psychiatric Association, 1987);

5. Performance within the normal range on the Peabody Picture Vocabulary Test-Revised (Dunn and Dunn, 1981; see Table 2 for scores);

6. Performance score one or more standard deviation below the norm on the Test of Word-Finding in Discourse (German, 1991); this allowed comparison of individual performances to those of a normative group, and provided a quantitative measure of each child's word selection performance (see Table 2 for scores);

7. Presence of overt behaviors related to word selection difficulty (as described by various authors, and

Table 2

Subjects' Scores on Standardized Tests

	<u>PPVT-R</u>		<u>TWED</u>	
	SS	%ile	SS	%ile
Subject 1	99	47	64	1
Subject 2	93	32	68	2
Subject 3	88	21	77	6

summarized in Table 1) in narrative samples collected during three discourse tasks: (a) picture-elicited narratives (PE), (b) story retelling narratives (SR), and (c) conversation with the clinician on familiar topics (CF). (These tasks are described in detail in the Procedure section of this chapter.)

Finally, it must be noted that these subjects had received previous speech-language intervention, as each had become eligible for these services upon completion of his integrated evaluation report and individualized education program document (IEP). Each subject's treatment records were reviewed to determine whether any specific intervention strategies for word selection had been utilized. Previous objectives had targeted various linguistic skills including vocabulary development, but there had been no documented treatment focusing on "word-finding," "word access," or "word retrieval."

Two parental permission forms were used. The first form was distributed to parents of prospective subjects requesting permission to screen their children for project eligibility. This form was also intended to establish parents' willingness for their child to participate should he/she be eligible. The second form served to request permission for eligible subjects to actually participate in the experiment. These can be found in Appendix A.

Background Information

Subject one. Subject One was a 9:2 year old boy with a special education classification of "learning disabled/speech impaired." He was enrolled in a self-contained special education class, but received mathematics instruction in a regular second grade class. According to the integrated evaluation report prepared by the pupil appraisal team of his school district, Subject One exhibited language-based learning problems soon after he started school. These problems were reportedly not due to lack of educational opportunity, or environmental, cultural, or economic disadvantage. Some of the descriptors used by classroom teachers and evaluators to characterize Subject One were as follows: deficient retention of sight words, poor decoding skills, difficulty comprehending textbook vocabulary, difficulty following spoken directions, inadequate expression of ideas, use of incorrect grammar, delayed responses, inadequate sentence length, high level of frustration, disorganization, inattentiveness, and anxiousness about school failure. The report also contained a specific reference to word selection difficulty: "(Subject One) demonstrated word finding and verbal sequencing difficulties when retelling a story. Sentence revisions were also noted."

Subject two. Subject Two was a 9:10 year old boy with a special education classification of "behavior disordered/learning disabled." He was enrolled in a

special education class for approximately half the school day, and attended a regular third grade class for the remainder of his instructional time. According to his evaluation, Subject Two began to demonstrate poor academic achievement and disruptive behavior at the beginning of his school career. He scored within one standard deviation below the mean on a standardized test of reading ability, and greater than two standard deviations below the mean on a standardized measure of spelling skills. In his student interview, Subject Two said that his easiest subject was math, while reading and spelling were more difficult. Some of the terms used by teachers and evaluators to describe Subject Two included: problems attending to task, poor attention span, difficulty sitting still, impulsiveness, poor work/study habits, poor self concept, general poor academic achievement, requiring repeated directions, letter and number reversals during reading and writing (e.g., reading "L.S.U." for "U.S.L."), and low self esteem.

Subject three. Subject Three was a 9;6 year old boy with a special education classification of "learning disabled/speech impaired". He was enrolled half time in a special education class, and spent the remainder of the day in a regular third grade class. Subject Three's learning difficulties were discovered when he was in kindergarten. According to his evaluation report, this subject's instructional objectives had been changed numerous times, and he had been moved back and forth from regular classes

to self-contained special classes at the request of his parents. No sustained academic progress had been observed. Verbal expressive language was considered a weakness for Subject Three. He was said to be functioning within the "well below average" range in broad reading skills, and within the "lower extreme" range in broad written language skills. Although he produced only two speech sound errors (i.e., "f/th" substitution in the final word position and "er" distortion), he was described as "difficult to understand". Other terms used by teachers and examiners to describe Subject Three included weak word recognition, weak reading comprehension, poor academic progress, weak written language skills, a tendency to be manipulative, aggressiveness, hyperactivity, uncooperative behavior, disorganization, and attention-getting behavior.

Materials

Pictures

To elicit narratives with pictures, 25 colored drawings from the Apricot 1 series (Arwood, 1985) were used as stimuli. Each Apricot drawing depicts an ordinary, familiar event that is disrupted by an extraordinary occurrence. The drawings are purposefully designed to elicit meaningfully sequenced stories. For example, one drawing in the series portrays a woman pushing a cart full of groceries down a store aisle. Her head is turned to see that a child has knocked over a display of cans. The store

manager looks on with an angry expression. The familiarity of the setting, events, objects, and characters in the pictures serves to encourage production of narratives that are more than mere picture descriptions. All 25 drawings are described in Appendix B.

Stories

To elicit narratives through story-retelling, 25 story segments from the second grade level basal reading text In Sunshine and Shadows, by Mabel O'Donnell (1977) were used as stimuli. The subjects had not used this basal series in their classes. This set of stories was chosen because each story was written by the same author, with relatively consistent structure, style, and complexity. All stories were contained in the same volume, and established to be at a typical second grade readability level (Fry, 1977). It was considered important to control for structure, style, and complexity in order to avoid a situation in which variability in word selection behavior could later be attributed to differences in these aspects of the stimulus stories. The second grade readability level was selected because it was one full year below that of the subjects' current level of academic instruction, so it could not be argued that subjects had word selection problems because the story content was too difficult.

Conversation Starters

To elicit conversational discourse, 25 pre-written "conversation starters" were used as stimuli. These were

short paragraphs designed by the experimenter to initiate conversation by sharing a slightly extraordinary experience from daily life. Some of the underlying themes of these starters were school activities and events (e.g. Christmas program, playground fights), activities of daily living (e.g., haircuts, laundry, car trouble), holiday activities (e.g., visiting relatives, wrapping gifts), and recreational activities (e.g., football games, fishing). A typical conversation starter was structured as follows: "About a week ago, my son was fishing in our pond, and he caught a snapping turtle about this big (gesture for size). It was just hanging on the end of his line -- his daddy had to help him get it off and throw it back in the pond." The same conversation starter was used (i.e., read verbatim) with all three subjects on a single day of data collection. These are listed in Appendix C.

Procedures

The study was sequenced in five stages as follows, with each phase occurring across five 15-minute sessions for each subject:

(1) collection of baseline samples of each subject's linguistic behavior while engaged in three different discourse tasks;

(2) administration of discourse-based treatment to each subject within a single discourse task, while baseline conditions continued within the remaining two tasks; tasks

were counterbalanced so that each subject received treatment in a different order (see Table 3 for the order of treatment presentation);

(3) administration of treatment to each subject within a second randomly selected discourse task, while treatment continued in the first task, and baseline conditions continued in the remaining task;

(4) administration of treatment to each subject within the third discourse task, while treatment continued in the other two tasks;

(5) collection of post-treatment baseline samples of each subject's linguistic behavior while engaged in each of the discourse tasks.

Pre-treatment Baseline Phase

Initially, baseline measures of overt word selection behaviors were collected on videotape and audiotape during subjects' participation in the three different discourse tasks described below. (Sample transcripts of each task are included in Appendix D.)

Picture-elicited narratives. Subjects were required to produce picture-elicited narratives. This was a monologic discourse task in which subjects were provided with an action picture stimulus and asked by the experimenter to, "Tell me a story about this picture." As the subjects concluded their comments about each picture, the experimenter encouraged further discourse by asking "Is there anything else you can add to your story?"

Table 3

Treatment Schedule

	Week 1	Week 2	Week 3
Subject 1	PE	PE, SR	PE, SR, CF
Subject 2	SR	SR, CF	SR, CF, PE
Subject 3	CF	CF, PE	CF, PE, SR

PE = Picture-Elicited Narrative
 SR = Story-Retelling Narrative
 CF = Conversation on a Familiar Topic

Story-retelling narratives. Story-retelling was a monologic discourse task in which the experimenter read a short, age-appropriate story to the child, then instructed the child to, "Tell the story back to me." No picture stimuli were present as cues during the retellings. As the subjects concluded their retelling of each story, the experimenter encouraged further discourse by asking "Can you remember anything else that happened in the story?"

Conversations on familiar topics. Conversation was a dialogic discourse task in which the child and experimenter had relatively equal speaker-listener roles. No picture stimuli were present. Conversational topics were pre-selected based on the likelihood that they would be familiar to all subjects. For experimental purposes, pre-written "conversation starters" (as described above) were read aloud to each subject to elicit conversation. If the child did not respond by spontaneously taking a conversational turn, the experimenter encouraged participation by asking leading questions such as, "Has that ever happened to you?" and "Did you ever see one of those?" As the conversations progressed, the experimenter helped maintain the conversational topic with reactive comments (e.g., "Wow!" or "Really!" or "Hm..."), elaborative comments, personal opinion comments, and relevant questions. A sample transcription of a conversation is as follows:

Experimenter: Have you seen those big snapping turtles? [relevant question]

Subject 1: Yeah.

Experimenter: They have those points all over their shells. [elaborative comment]

Subject 1: (nods) I seen a boy and he had one before But he had a little one He didn't have a big one He had it in a bucket

Experimenter: And it was like a pet. [elaborative comment]

Subject 1: They just caught it was in like a (gestures) white bucket I I don't know what he did with him

Experimenter: Hm. [reactive comment]

Subject 1: Probably put it back

Experimenter: Do you fish? [relevant question]

Subject 1: Yeah I like to fish I love animals but I hate sometimes I don't like fishin because um it whenever the hook gets in the fish's mouth... (disgusted facial expression)

Experimenter: Think that's gross? [relevant question]

Subject 1: (nods)

Experimenter: I don't like fishing because you have to wait. You have to just sit there

and wait a long time before a fish
comes [personal opinion comment]

Subject 1: (nods) We My Aunt Pat used to have a
big, big, big, big pond and we used
to uh take bread and feed em and all
And sometimes whenever we wanna go
fishin we'd take the bread we'd do
that sometimes and uh couple days
if we'd wanna go fishin we'd take some
bread and put it out and we'd uh
take our fishin pole and put bread on
it and whenever uh uh the they
gettin the bread and they get that
one (gestures) and then you just
pull em up (gestures)

Experimenter: Yeah. That's pretty tricky. [personal
opinion comment]

This activity was not allowed to become a question and
answer session controlled by the experimenter. If a
subject attempted to change the general topic, the
experimenter re-directed the conversation back to the
original topic with a comment or question. Subjects were
allowed to explore various aspects of the general topic.
This activity was terminated when a subject indicated that
the topic had been exhausted, either directly by stating
that he had nothing left to say, or indirectly by

shrugging, providing only one word responses, or repeatedly changing the topic.

Experimental Treatment Phases

The goal of the experimental treatment was to facilitate effective on-line word selection processing in children with LLD. The experimenter's primary role as clinician was to provide immediate, appropriate feedback when subjects exhibited observable word selection difficulty during discourse production. The purpose of the feedback was not to directly cue production of a word, but to (1) make the subject aware that a communication breakdown had occurred; (2) to systematically assist the child through the word selection process; and (3) to confirm the target word when it was produced.

All experimental treatment sessions were recorded on audio- and videotape. During treatment, the experimenter listened carefully to the subject's discourse. When observable word selection difficulty occurred (i.e., any of the behaviors defined previously in this chapter), the experimenter's strategy was to (a) recognize the behavior, (b) allow completion of the behavior, then (c) provide appropriate feedback. Each type of observable word selection behavior in a subject's discourse elicited a specific type of feedback from the clinician. The feedback varieties are described below, and the rationale for each one is given. Examples of the word selection behaviors and

appropriate responses for intervention can be found in Table 4.

Request for associative information. Some word selection behaviors (e.g., explanations, extended delays) were interpreted as indications that a subject was either experiencing extreme difficulty accessing a target word, or had given up completely. In these situations, the experimenter responded with a request for associative information (e.g., "Can you describe it for me?" or "What does it look like?" or "Where would you find one of those?"). The purpose of this type of feedback was to encourage the subject to use various aspects of his semantic association network to facilitate word retrieval. The underlying rationale was the belief that by activating relevant information during the word selection process, the chances of efficiently retrieving that word in the future would be enhanced.

Request for clarification. Certain word selection behaviors (e.g. indefinite references, substitutions) were interpreted as indications that a subject was electing not to interrupt his discourse for the time necessary to select a precise target word, but was opting instead to use another, more readily accessible, word or phrase in place of a target word, and to effectively place the burden of inference on the listener/experimenter. In these instances, the experimenter responded with a request for clarification (e.g., "What do you mean?" or "What thing?"

Table 4

Discourse-Based Intervention for Word Selection Difficulty

OWSB:	Reformulation
Example:	"She's/she was/she used to ring a bell."
Treatment Purpose:	To give confirmation that the target message has been received, and to reconstruct the utterance to facilitate the flow of discourse
Treatment Response:	"Oh, she would ring a <u>bell</u> ."
OWSB:	Repetition
Example:	"She/she used to ring a bell/a bell."
Treatment Purpose:	To give confirmation that the target word was a suitable choice, and to maintain the flow of discourse
Treatment Response:	"I see..." or "Okay..."
OWSB:	Interjection
Example:	"She used to ring, well, a bell."
Treatment Purpose:	To give confirmation that the target was a suitable choice, and to maintain the flow of discourse
Treatment Response:	"A bell..."

(table cont'd)

OWSB: Delay (30 seconds or less, resulting in production of target word)

Example: "She was ringing the um, uh, bell." or
"She was ringing the...bell."

Treatment Purpose: To give confirmation that the target word was a suitable choice, and to reconstruct the utterance to facilitate the flow of discourse

Treatment Response: "Oh, she was ringing the bell."

OWSB: Revision

Example: "She had a ringer/a bell."

Treatment Purpose: To give confirmation that the target word was the better choice, and to maintain the flow of discourse

Treatment Response: "Right, a bell." or "Oh, a bell."

OWSB: Substitution

Example: "She always had that clanger."

Treatment Purpose: To establish awareness that the substituted word was not precise enough, and to encourage further word selection processing

Treatment Response: "Clanger?" or "What do you mean by 'clanger'?"

(table cont'd)

OWSB:	Indefinite Reference
Example:	"She rang that thing."
Treatment Purpose:	To establish awareness that a communication breakdown has occurred, and that more information is needed
Treatment Response:	"Thing?" or "What do you mean?" or "What 'thing'?"
OWSB:	Explanation
Example:	"She rang...I forgot what it's called."
Treatment Purpose:	To encourage use of semantic association to facilitate word selection processing
Treatment Response:	"Can you describe it for me?" or "What does it look (sound, feel) like?" or "What does it remind you of?"
OWSB:	Delay (Longer than 30 seconds, word selection processing seems to be at a standstill)
Example:	"She was ringing the um, the uh.... uuuum, you know, uh.... a um...."
Treatment Purpose:	To encourage use of semantic association to facilitate word selection processing
(table cont'd)	

Treatment Response: "Can you describe it for me?" or "What
does it look (sound, feel) like?" or
"What does it remind you of?"

OWSB = Overt word selection behavior

or "But what is it called?) along with a confused facial expression. This type of feedback was intended to make the subject aware that a communication breakdown had occurred, and that a more precise term was necessary to convey the message. In this way, the subject was led back into the process of word selection. The rationale for this type of feedback was the belief that if the subject was able, in time, to access a target word on his own (i.e., without a superficial cue or outright provision of the target word by the listener/experimenter), he should be able to retrieve the word more easily in the future.

Confirmation/reconstructing. Often, subjects were eventually able to successfully access and produce a target word, but in so doing, exhibited behaviors that were interpreted as indications of word selection difficulty (e.g., revisions, interjections, repetitions, reformulations). When such behaviors occurred, the experimenter immediately reacted to confirm the suitability of the word selection (e.g., "I see." or " Okay.), along with a nod or other suitable facial expression. When necessary, the experimenter also reconstructed the utterance to help preserve the flow of discourse. The rationale was that whenever a target word was produced, productive word selection processing was occurring, and should be encouraged. In addition, it was considered important that discourse on the current topic be maintained

In order to provide further natural opportunities for accessing and producing the same target word.

Phonemic cuing or provision of target word. It was rare for a subject to fail to produce a target word after repeated attempts and consequent feedback responses from the experimenter. On these infrequent occasions, the experimenter responded first by cuing the subject with the initial phoneme of the target word, and, if this was unsuccessful, by providing the target word outright. These types of feedback were used only as "last resort" measures, to avoid frustrating the subject and to preserve the discourse interaction. The rationale was that, even when word selection processing was unproductive, it was important to maintain the current topic of discourse so that further natural opportunities to attempt the same target word might occur.

Constraints on providing feedback during treatment.

It became evident early in the pre-treatment baseline period that it would be impossible for the experimenter/clinician to respond to every observable word selection behavior exhibited by the subjects. The behaviors often occurred one after another, as in this example, in which a subject was discussing his mother's stained laundry: "You know uh...whenever you wash white pants wth...something else like uh... some other kind of uh, uh ...thing, you know..." To interrupt repeatedly and provide feedback after each behavior would have defeated

the objective of the intervention by completely destroying the flow of the subjects' discourse. In view of this, it was decided that the experimenter would use the natural pauses in subjects' narratives as opportunities to provide feedback. If the above example had occurred during a treatment segment, the experimenter would have waited for the subject to finish, then responded by asking for clarification, "What kind of 'thing'?"

Post-treatment Baseline Phase

After all phases of the experimental treatment were completed, a follow-up set of baseline measures were collected on audio- and videotape as subjects participated in each of the three discourse tasks. The experimenter, as usual, did not provide intervention/feedback during this baseline phase.

Data Analysis

Transcription

Recordings of all baseline and treatment sessions were transcribed verbatim by the examiner using standard orthography. All utterances, pauses, and other nonfluent behaviors produced by the subjects and the experimenter were included. Pauses in the subjects' discourse that lasted less than six seconds were marked only by gaps in the transcription; those that lasted six seconds or longer

were counted as delays. When subjects used gestures to enhance their discourse, this was noted in the transcript.

Segmentation and Coding

The subjects' narrative and conversational discourse segments were divided by the experimenter into T-units (Hunt, 1977) and fragments. The T-unit was defined as the shortest unit into which a linguistic utterance can be divided without leaving a remaining fragment. All T-units and fragments were numbered for identification. Next, each T-unit and fragment was examined for observable word selection behaviors (i.e., reformulations, repetitions, interjections, revisions, substitutions, indefinite references, explanations, and delays). Each observation was coded on the transcript itself. As a means of consolidating the coded behaviors for visual inspection and subsequent statistical analysis, the observations were counted and recorded by tallies on a separate form.

Reliability

To establish the reliability of the transcription, the segmentation, and the coding of the data, 12% of the data base (i.e., 27 task segments) was randomly selected and transcribed by a second examiner. Interexaminer agreement was 100% for the transcription, over 99% for the segmentation (four differences of opinion in 499 segments), and over 99% for the coding (three differences of opinion in 277 coded behaviors).

RESULTS

This study focused on the overt word selection behaviors present in the discourse of three children with language learning disabilities (LLD). Differences in incidence of these behaviors were investigated across three discourse tasks and with respect to the linguistic complexity of individual communication units. Each subject's response to a discourse-based treatment for improving word selection proficiency was studied.

Quantitative and qualitative data analyses will be presented. In the following quantitative analysis section, the first description will be a comparison of pretreatment and posttreatment baseline data. Next, treatment phases will be compared to concurrent baseline phases for each subject. The extended untreated baseline phases for individual tasks will then be evaluated with regard to concurrent treatment application to the remaining task. The next section will present a comparison of each subject's above and below average length T-units in terms of frequency of overt word selection behaviors. Finally, one subject's pretreatment and posttreatment baseline data will be assessed for changes in word selection behavior with examples from the data.

Quantitative Analysis

For the purposes of the present study, the ratios of total overt word selection behaviors to total words for each trial of each discourse task were converted to percentages. These percentages served as the data points upon which several of the following analyses are based. The data points were plotted across baseline and treatment phases for each subject and are presented in Figures 1 through 3.

Comparison of Initial Baselines to Posttreatment Baselines

When mean percentages were compared from pretreatment to posttreatment baselines (B_1 and B_2 , respectively), all three subjects demonstrated a decrease in the level of occurrence of overt word selection behaviors. Subject 1 had a B_1 mean of 12.07 ($SD = 6.40$) which decreased in B_2 to a mean of 9.27 ($SD = 4.48$). Subject 2 also showed a decrease from B_1 ($M = 8.93$, $SD = 4.85$) to B_2 ($M = 7.00$, $SD = 5.06$). Following this trend, Subject 3 demonstrated a decrease from B_1 ($M = 7.27$, $SD = 4.98$) to B_2 ($M = 5.20$, $SD = 3.95$).

One-tailed paired observation t-tests were used to compare B_1 to B_2 . To ensure the validity of this statistic, it was necessary to meet the assumption of independence-of-error components (Barlow & Hersen, 1984). The data were assessed for serial dependency using autocorrelation. For Subjects 1 and 2, no significant

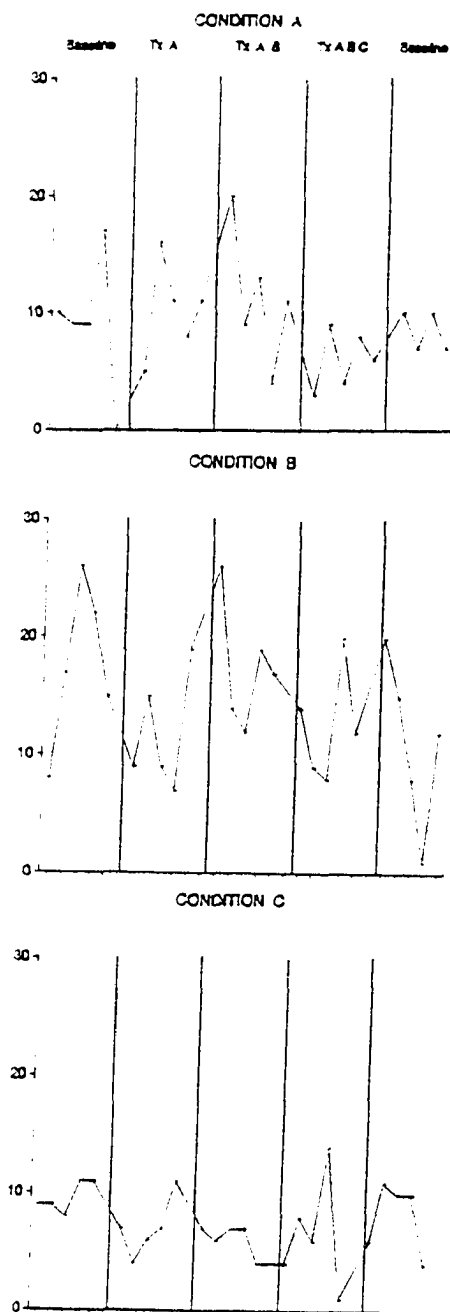


Figure 1. Percentages of overt word selection behaviors relative to total words produces by Subject 1 during three discourse tasks; Condition A = Picture-elicited narratives; Condition B = Story-retelling narratives; Condition C = Conversation on a familiar topic

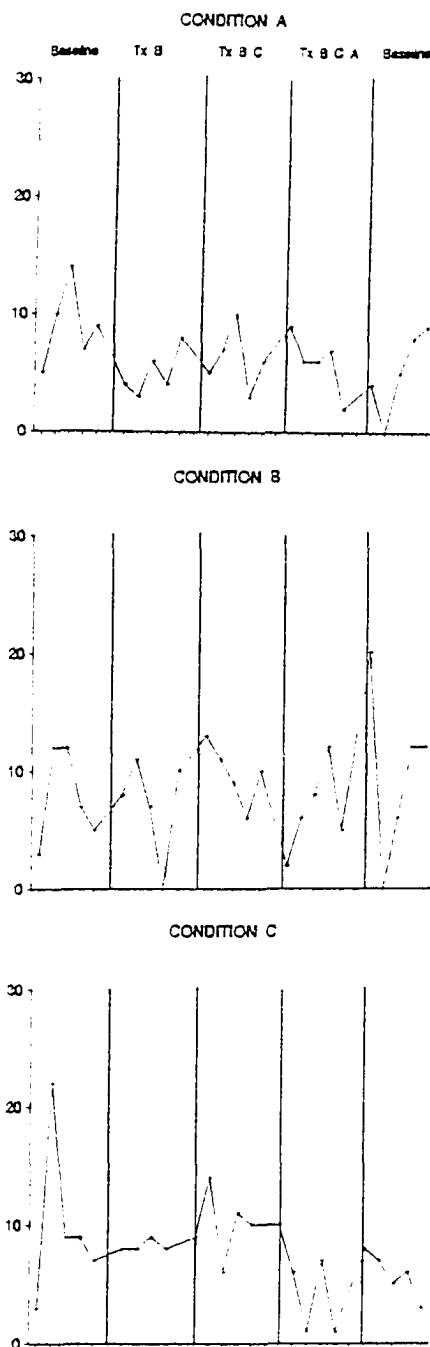


Figure 2. Percentages of overt word selection behaviors relative to total words produces by Subject 2 during three discourse tasks; Condition A = Picture-elicited narratives; Condition B = Story-retelling narratives; Condition C = Conversation on a familiar topic

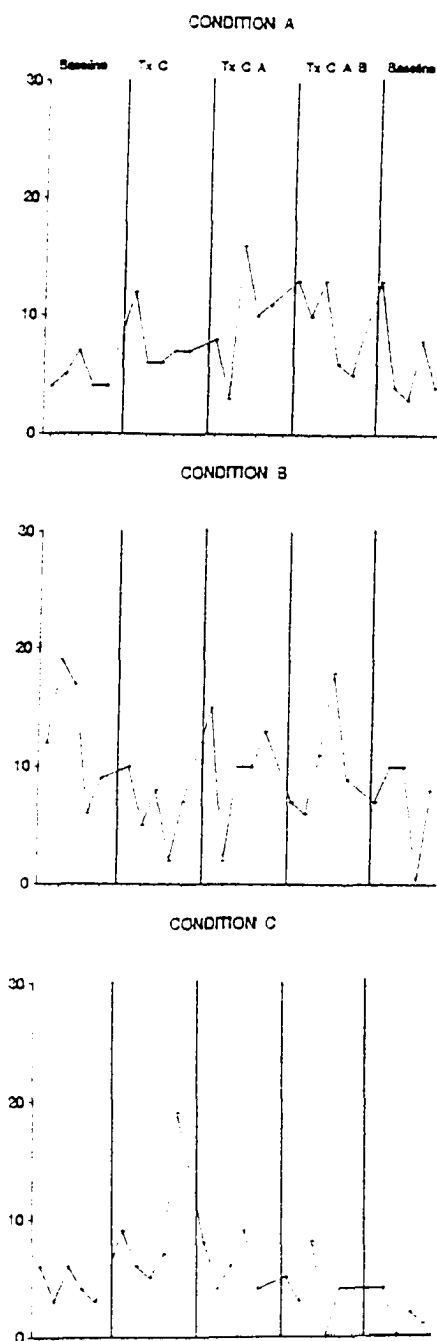


Figure 3. Percentages of overt word selection behaviors relative to total words produces by Subject 3 during three discourse tasks; Condition A = Picture-elicited narratives; Condition B = Story-retelling narratives; Condition C = Conversation on a familiar topic

autocorrelation was found [Subject 1 (B_1) $r = .394$, $p = .16$; (B_2) $r = .039$, $p = .898$; Subject 2 (B_1) $r = .22$, $p = .449$; (B_2) $r = .021$, $p = .944$]. The data for Subject 3 did contain significant autocorrelation in the first baseline ($r = .56$, $p = .04$), but not in the final baseline ($r = .054$, $p = .854$).

Results showed that although mean percentages of target behaviors consistently decreased, the differences were not large enough to reach a level of statistical significance [Subject 1: $t(28) = 1.28$, $p = .088$; Subject 2: $t(28) = 1.07$, $p = .147$; Subject 3: $t(28) = 1.32$, $p = .109$]. The results of these comparisons are summarized in Table 5.

Comparison of Baseline Phases to Adjacent Treatment Phases

Mean percentages were compared from baseline phases to the initial treatment phase for each task. One subject demonstrated a significant decrease in the level of overt word selection behaviors. The data for Subject 3 revealed an abrupt shift from baseline ($M = 10.47$, $SD = 5.14$) to treatment ($M = 7.33$, $SD = 3.24$). Subject 2 showed a slight decrease in target behaviors from baseline ($M = 8.27$, $SD = 4.83$) to initial treatment ($M = 7.07$, $SD = 5.26$). Subject 1 actually demonstrated a slight increase in his mean percentage of target behaviors from baseline ($M = 9.00$, $SD = 5.14$) to initial treatment ($M = 11.47$, $SD = 6.51$).

One-tailed paired observation t-tests were used to compare baseline means to adjacent treatment means for each

Table 5

Comparison of Initial Baselines to Posttreatment Baselines

	Subject 1	Subject 2	Subject 3
B ₁ Mean	12.07	8.93	7.27
SD	6.40	4.85	4.98
B ₂ Mean	9.27	7.00	5.20
SD	4.48	5.06	3.95
t(28)	1.28	1.07	1.32
p	.088	.147	.109

subject. Again the data were assessed for serial dependency by examining autocorrelation. No significant autocorrelation was found in the data for any subject [Subject 1 (baseline) $r = .032$, $p = .352$; (treatment) $r = .014$, $p = .962$; Subject 2 baseline) $r = .060$, $p = .840$; (treatment) $r = .032$, $p = .914$; Subject 3 (baseline) $r = .139$, $p = .635$; (treatment) $r = .045$, $p = .870$].

For Subject 3, the difference between baseline and treatment was statistically significant [$t(28) = 2.0$, $p = .028$]. For Subjects 1 and 2, the differences between percentages averaged across all five sessions in baseline and adjacent treatment did not prove to be statistically significant [Subject 1: $t(28) = -1.17$, $p = .125$; Subject 2: $t(28) = .84$, $p = .203$]. These results are summarized in Table 6.

Comparison of Treatment Phases to Concurrent Extended Baseline Phases

In keeping with the multiple baseline design, each subject participated in two discourse tasks with extended baseline phases prior to treatment. Visual inspection of the plotted data (see Figures 1-3) reveals considerable variability among the data points from task to task. There is no clear increase or decrease in the target behaviors during extended baseline phases as treatment was applied to the remaining task. To explore this variability, mean percentages of target behaviors for each task were

Table 6

Comparison of Baseline Phases to Adjacent Treatment Phases

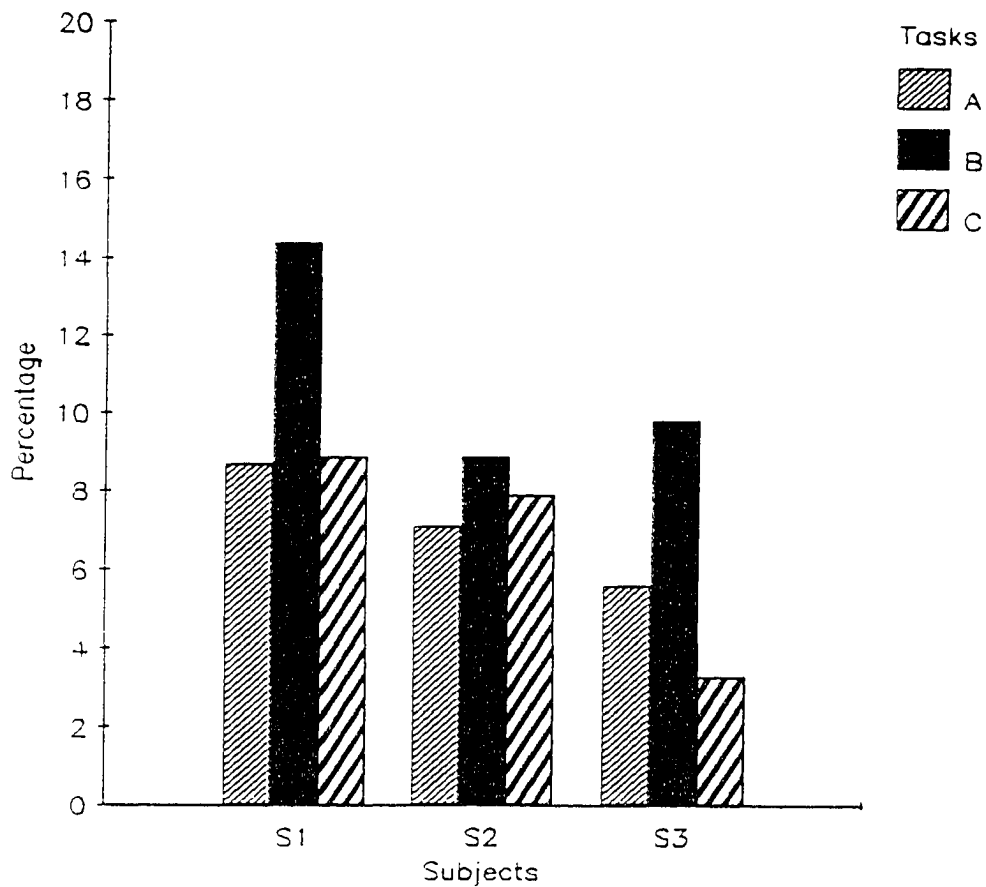
	Subject 1	Subject 2	Subject 3
Baseline			
Mean	9.00	8.27	10.47
SD	5.14	4.83	5.14
Treatment			
Mean	11.47	7.07	7.33
SD	6.51	5.26	3.24
$t(28)$	-1.17	.84	2.00
p	.125	.203	.028

compared. All subjects demonstrated a higher level of overt word selection behaviors when engaged in the story retelling task. This information is presented in Figure 4.

In order to discover if differences among the three tasks were significant, a repeated measures ANOVA was applied to the data. For Subjects 1 and 3, results showed that the level of variability was statistically significant [$F(2,18) = 4.34$, $p = .029$; $F(2,18) = 9.87$, $p = .001$, respectively]. The variability in the data for Subject 2 did not prove to be significant [$F(2,18) = 0.45$, $p = .644$].

Comparison of Above and Below Average Length Communication Units

Each subject's communication segments for the pretreatment and posttreatment baseline phases were divided into groups based on length (i.e., number of words per segment). First, the mean number of words per segment was calculated for each subject's daily session. The segments were then assigned to the "long" group if they contained more words than the mean, and the "short" group if they contained fewer. Next, the total number of overt word selection behaviors for each day was calculated, then divided according to whether they occurred during a long or short segment. The ratios of target behaviors occurring during each group of segments to total target behaviors were converted to percentages.



A = Picture-elicited narratives
B = Story-retelling narratives
C = Conversation on a familiar topic

Figure 4. Mean percentages of overt word selection behaviors produced by all three subjects during baseline phases

When the percentages were compared, it was noted that a higher percentage of target behaviors almost always occurred during longer segments. For Subject 1, this was true for nine of the ten sessions being assessed. For Subjects 2 and 3, one session had target behaviors divided evenly among long and short segments, but eight of the remaining nine revealed higher percentages within longer segments.

In order to learn the significance of this finding, the sign test was applied. Results for all three subjects were significant at the .05 level.

Qualitative Analysis

In this section, patterns of occurrence of each category of overt word selection behavior will be discussed. Several observable and relevant trends in concurrent discourse behaviors will then be presented. Finally, extraordinary word selection behaviors of individual subjects will be described and analyzed.

Indefinite References

Indefinite references represented a very small subset of the overt word selection behaviors that were measured, and their frequency of occurrence did not shift significantly from pretreatment baseline to posttreatment baseline [Subject 1: $B_1 = 2\%$, $B_2 = 1\%$; Subject 2: $B_1 = 1\%$, $B_2 = 4\%$. Subject 3: $B_1 = 5\%$, $B_2 = 8\%$]. It seemed that

these three subjects were aware of the need to define new information for the listener. They would generally opt for indefinite references under only two conditions: (a) during the picture-elicited narrative task, when they could point to an item in the listener's view, or (b) when they simply could not provide any single term they deemed acceptable. In the latter condition, indefinite references were virtually always preceded or followed by a characterization (e.g., description, function, gesture, sound effect) of the target referent. Examples from the data are presented below.

1. Subject 3, describing a picture of two rabbit cages, pointed to each cage door and said, "That thing's off. That thing's closed. That's two cages."
2. Subject 2, discussing his brother's crab trap, said, "My brother and um (pause) and like, he, he has like this, like tanks (gesture) you know, made out of like wood, and, and on the top, it's like, it's like, like (points to an item in the room) just like this, but there's nothin' on the top right here. It's just the sides and the bottom. There's nothin' on the top. And um, he goes, and he has this thing."

3. Subject 3, talking about the gear shift on his new bicycle, said, "It's...It has a thing (gesture) off-road and uh mountains."

Explanations

Explanations were produced relatively infrequently by all three subjects, and there was virtually no change in their frequency of occurrence between baselines [Subject 1: $B_1 = 0\%$, $B_2 = 3\%$; Subject 2: $B_1 = 0\%$, $B_2 = 1\%$, Subject 3: $B_1 = 1\%$, $B_2 = 0\%$]. Explanations appeared to be used as devices to stall for time, or to provide the listener with a reason for the delay involved in recalling a target noun. Sometimes they were produced in interrogative form as if prompting the listener to supply the word, but never in a way that denoted helplessness. Examples of explanations are as follows:

1. Subject 1, describing a picture of people dressed in winter clothing: "They're wearin'...mm...I forgot what you call 'em...uh they have on a hood..."
2. Subject 1, pointing to a white tube with a red cross in a picture: "I don't know what it's called, but it's somethin' like medicine that you put on your uh...your um bo-bos."
3. Subject 2, telling about a local arcade: "They have one over there at um...what do you call it? Uuuuuh (pause) Sillyville."

Substitutions

Substitutions were relatively common in the discourse of these three subjects. For Subjects 1 and 2, frequency of occurrence of substitutions did not shift appreciably between baselines [Subject 1: $B_1 = 6\%$, $B_2 = 4\%$; Subject 2: $B_1 = 4\%$, $B_2 = 6\%$]. Data analysis did reveal a downward shift of five percentage points for Subject 3 ($B_1 = 8\%$, $B_2 = 3\%$).

When substitutions were used, these subjects seemed to consistently select terms that signaled their intended meanings as closely as possible without functional use of their actual target words. The subjects frequently created novel, innovative terms by combining familiar words, and sometimes they would augment these with gestures and sound effects (Clark, 1987).

The data for these subjects revealed no preference among the various substitution subtypes that have been identified. All three subjects used terms that were related to the expected adult target phonologically, semantically, and/or perceptually. Examples of substitutions are presented below.

1. Subject 2, describing a doctor's office scene:
"And he has a temperature thing in his mouth."
2. Subject 1, retelling a story about children playing detective: "H- he and she said, "I was a good um, uh, (pause) undercover."

3. Subject 3, discussing the class bully: "Shane keeps on getting in trouble and keeps on getting intentions."

When substitutions occurred during treatment, the subjects were often able to produce an expected target term following the intervention sequence. Sometimes a mere request for clarification would elicit the target term. In other instances, subjects would produce the target term in response to leading questions and semantic cues. It was necessary, in a few cases, to trigger production of the target term using phonemic cues; this was done only when a subject appeared frustrated. Examples of treatment sequences involving substitutions are presented below.

1. Subject 1, describing a picture of a vegetable garden: "They pickin' uh (pause) they pickin all kinds of... food from the garden and..."
 Experimenter: "All kinds of food, like..."
 Subject 1: "Uh...vegetables."
 (later in the same task)
 Subject 1: "He's holdin' the uh...basket with someth- ...fruit in it."
 Experimenter: "Fruit?"
 Subject 1: "Uh vegetables, I mean."
2. Subject 2, retelling a story about a football game: "The last two other um rounds in the

football f- um game was...they didn't score
nothin'."

Experimenter: "Right...they are like 'rounds',
but there is a name for them."

Subject 2: "Uh..." (pause)

Experimenter: "A football game's divided into
four..."

Subject 2: "Quarters."

3. Subject 3, describing a picture of a camping
scene: "The boy's bringing a fire to put on
it."

Experimenter: "He's bringing a fire to put on
it?"

Subject 3: "The firewood."

Interjections

In the pretreatment baseline for Subjects 1 and 2, empty words accounted for a significant percentage of the overt word selection behaviors measured (14% and 24%, respectively). For Subject 1, the percentage of interjections stayed the same in the posttreatment baseline (14%). Subject 2 demonstrated a decrease of four percentage points for this behavior ($B_2 = 20\%$). These two subjects appeared to use interjections as devices to (a) maintain the listener's attention, (b) stall for time, (c) achieve a "smoother" discourse delivery, or (d) serve as basket terms to avoid naming every item in a group (e.g.,

"He hangs around with some boys and all."). Interjections were often prolonged (e.g., "weeeeee..."), or produced slowly in a string (e.g., "Now... let... me... see..."). Observation of the pretreatment baseline data for the picture elicited narrative task revealed that Subject 1 would frequently use silent pauses before and during his description. By the posttreatment baseline, he almost always used the phrase "It... looks ... lllllike..." at the beginning of his picture elicited narratives.

It was noted that Subject 3 demonstrated a relatively low percentage of interjections in the pretreatment baseline (2%). Observation of his transcribed discourse showed that during the course of the study, he began to use interjections in a manner similar to that of the other subjects. In the posttreatment baseline for Subject 3, data revealed that his use of interjections had increased to 16% of the total behaviors measured.

Delays

Filled and unfilled pauses, as previously defined (six seconds or longer, occurring within the boundaries of a T-unit or fragment), accounted for a low percentage of the measured behaviors for Subjects 2 and 3; virtually no change was observed between baselines [Subject 2: $B_1 = 1\%$, $B_2 = 0\%$; Subject 3: $B_1 = 0\%$, $B_2 = 2\%$]. Subject 1 used these types of pauses more often, but also showed no observable change between baselines ($B_1 = 9\%$, $B_2 = 9\%$).

It should be emphasized, however, that while long delays occurred only occasionally within the boundaries of T-units and fragments, both types of pauses frequently occurred before and between communication units in the discourse of all three subjects. These longer delays seemed to function more often as devices to allow time for general discourse planning than as behaviors related to word selection. This pattern can be observed in the following examples from the data:

1. Conversation task:

Experimenter: "How was your holiday?"

Subject 2: "Uuuuh (prolonged) I went to my dad's and ate turkey on Thanksgiving."

Experimenter: "Hm. Only turkey?"

Subject 2: "Uuuh (prolonged) And some other things."

2. Story retelling task:

Subject 1: "Uh...uh...Rusty told about

hissself...Uh like uh (pause) nobody liked him."

"And uh, uh, so uh (pause) uh then uh his grandpa wanted to trade Rusty..."

Shorter pauses, filled and unfilled, were observed to occur frequently within T-unit and fragment boundaries for all three subjects. These delays did appear related to word selection, as they occurred before major elements like nouns and pronouns, verbs, adjectives, and prepositions.

These shorter delays contributed heavily to the choppy, disconnected quality of these subjects' discourse.

Examples of shorter delays are recorded below.

1. Subject 1, retelling a story: "Wh-whenenever he uh... used to live out in the country he used to uh, uh...run away the uh...brown rabbits and all."
2. Subject 3, retelling a story: "The uh...man jumped out of his car and um...was walkin' with him while he was walkin'."
3. Subject 2, in conversation: "They're um...fixing um...a pipe or something."

Revisions

A moderate portion of the total measured behaviors for Subjects 1 and 2 was comprised of revisions. Subject 3 exhibited a large decrease in revisions from pretreatment baseline (33%) to posttreatment baseline (17%). Subject 2 demonstrated a more modest decrease of four percentage points ($B_1 = 12\%$, $B_2 = 8\%$). Little change was noted across pretreatment and posttreatment baselines for Subject 1 ($B_1 = 8\%$, $B_2 = 10\%$).

In order to discover the source of this shift, the transcribed data for Subject 3 were reviewed. It appeared that many of the revisions produced by Subject 3 during pretreatment baseline occurred when he was trying to use pronouns as referents, especially during the story-retelling task. Examples from pretreatment baseline

data (story-retelling task) for Subject 3 are provided below.

1. "They was doing everything what they, she can't do...She said he, she wasn't good at nothin'."
2. "I, she, and he told her, them there's a old hou- there's a house."
3. "When she went back, sh-he was in the backyard...and sh- he said, 'No, I'm just paintin' it for another friend.'"

The posttreatment baseline data for Subject 3 revealed only one example of a revision of pronouns during the story retelling task. Subject 3 demonstrated a more fluent usage of pronoun referents, as in the following excerpts:

1. "They said uh...Christmas is comin'. And uh...they were ridin' down with sleds...And uh the man came by. And he was cold. And uh...his face is red...And uh...They were bulldin' a snowman."
2. "The girl said they couldn't do nothin'...and he said, 'Run along' and 'I helped you enough.' And he looked down at the puddles in, on his doorway. And then he shut the door."

Repetitions

Repetitions of initial speech sounds, single words and phrases were common in the discourse of all three subjects. Subject 2 showed a substantial decrease (i.e., seven percentage points) in the level of occurrence of

repetitions from pretreatment baseline to posttreatment baseline, while Subjects 1 and 3 demonstrated modest decreases [Subject 1: $B_1 = 26\%$, $B_2 = 23\%$; Subject 2: $B_1 = 31\%$, $B_2 = 24\%$; Subject 3: $B_1 = 19\%$, $B_2 = 16\%$].

Repetitions were another factor (like the short, filled and unfilled pauses) that contributed strongly to the choppiness of the subjects' discourse. They often occurred at the beginning of clauses, and seemed to function (a) as starters, (b) as time fillers, or (c) as bridges between clauses; that is, repetitions seemed to be preferred over silent pauses. Examples of various types of repetitions are presented below.

1. Subject 2, in conversation about a playground incident: "Well, so- somebody mugged her a- at that recess and took took um... her... freezepop money."
2. Subject 2, describing a picture of an arcade scene: "These two boys are fighting 'cause 'cause um they they're arguing about who who's gonna play the game first."
3. Subject 1, retelling a story about a boy's birthday: "And he s- said that um he he wanted his presents."

DISCUSSION

Children with LLD have difficulty making the specific word choices necessary for the effective production of decontextualized discourse. This difficulty can be observed when nonspecific word substitutions and various linguistic nonfluencies occur frequently during actual discourse production. Due to the absence of picture cues and listener feedback, story telling tasks are particularly difficult for LLD students. Since ineffective discourse is considered an obstacle to academic achievement, this study has presented an intervention strategy for increasing word selection proficiency in school age children with LLD.

Summary of Findings

Quantitative analysis of the data revealed the following:

(1) All three subjects produced fewer overt word selection behaviors after treatment than they did initially.

(2) One subject exhibited a relatively immediate shift, while the other two made more gradual changes.

(3) There was significant evidence that the three discourse tasks were not equal in complexity. In fact, the

story-retelling task was much more difficult for these subjects than the picture-elicited narrative or the conversation.

(4) Longer, more complex communication units resulted in significantly higher levels of linguistic nonfluency, including overt word selection behaviors.

Qualitative analysis revealed that these subjects benefited from (a) frequent opportunities to engage in discourse, and (b) meaningful feedback. Examination of the coded data on individual types of overt word selection behaviors revealed that individual subjects exhibited considerable increases or decreases in their use of particular behaviors.

This chapter will begin with a discussion of these findings and how they compare and contrast with information from previous studies. Next, the limitations of the present study will be presented. Finally, implications for clinical assessment and intervention, as well as future research, will be explored.

Relationship of Findings to Literature

Before beginning the business of integrating the current findings with existing information, it is important to point out that comparisons are rendered difficult by the dissimilarities that exist between this and other investigations. The experimental treatment described in

this dissertation and the three previously reported intervention studies (Casby, 1992; McGregor & Leonard, 1989; Wing, 1990) differ in several ways. First, this treatment was discourse-based, while the other treatments were concerned with recall of single, pre-selected, picturable nouns. In this study, rather than training subjects to retrieve certain concrete nouns in response to picture cards, the primary objective was to improve the efficiency of word selection during narrative and conversational discourse. Intervention was provided within the discourse tasks themselves, at the point of actual word selection difficulty.

A second difference was that, in this study, gains were measured in terms of changes in the frequency of various overt word selection behaviors rather than in terms of single word recall. All three previous treatment studies seemed to be concerned primarily with improving picture naming skills. Since actual students in real schools are rarely asked to name pictured objects on cards, the present study attempted to address functional on-line word selection in a practical manner.

The types of treatment feedback used constitute another difference between this and previously reported treatments. In the present study, feedback was designed to provide opportunities for subjects to repeatedly experience successful word selection processing. Subjects were always

expected to produce target words on their own if possible. If necessary degrees of assistance were provided progressing from minimum to maximum. This approach was quite different from the three other experimental treatments, in which investigators routinely modeled target nouns at the first sign that a subject was having difficulty. Also, the present treatment did not involve the direct training of word selection strategies, as did two previous experimental treatments (McGregor & Leonard, 1989; Wing, 1990). Instead, subjects were first given ample time to produce their own target words independently, and then encouraged, via feedback, to explore various aspects of their semantic networks.

In sum, there are substantial procedural and analytic differences between this investigation and the three earlier studies. With these dissimilarities in mind, the information from this study can be added to the existing knowledge about treating word selection problems in LLD children.

General Treatment Efficacy

All of the preceding reports have included claims of at least some degree of success in remediating children's word finding problems. McGregor and Leonard (1989) found that for their two subjects, an elaboration treatment (e.g. thinking of rhyming words, discussing similarities and differences between training words and semantically similar

words) and a retrieval treatment (e.g., categorizing words, discussing initial phonemes, discussing physical location of items), combined, caused greater naming accuracy and recall of a closed set of words, with no evidence of generalization to other words. Likewise, Casby (1992) showed that his single subject responded to his elaboration treatment (e.g., naming pictures, telling about each item in a sentence, using pairs of items in a single sentence) by naming a closed set of words more rapidly, but, again, there was no generalization to other words. The present treatment caused three subjects to reduce the frequency of overt word selection behaviors exhibited during discourse production. All three subjects produced lower mean percentages of overt word selection behaviors during the post-treatment baseline sessions than they did in initial measures. It seems reasonable to believe that ongoing intervention would result in a continuation of this improvement.

The only previous investigation to yield evidence of generalization was reported by Wing (1990). Her phonological and perceptual treatment (e.g., segmenting words into sounds and syllables, imagining pictures and their spoken labels) caused five subjects to name pictures more efficiently, including pictures of untrained items. This was interpreted as a positive finding, but it must be emphasized that picture naming is a discrete skill. There

is no evidence to support a claim that a child who learned to name pictures efficiently would be able to flexibly select specific words, as needed, during on-line discourse. In fact, a disconcerting lack of efficacy has been found when language concepts are taught in single skill fashion (Damico, 1988; Fey, 1988; Norris & Hoffman, 1993). When one considers the all-encompassing difficulties experienced by LLD students (e.g., the present subjects, who were all attributed with long lists of problems by teachers and examiners), single skill training hardly seems justified in terms of time and money spent.

Due to their focus on training isolated words, none of the existing treatment studies yielded a data base of subjects' discourse samples. The data from the present study contained evidence of certain interesting shifts in individual subjects that occurred between baselines. For example, Subject 3 exhibited a substantial increase in his use of empty words (from 2% of total measured behaviors at pretest to 16% at posttest), while demonstrating decreases in other nonfluency categories. At first glance, this finding seemed to be a negative one. It has, however, been shown by others (Kowal, O'Connell & Sabin, 1985), that the use of empty words (also termed "parenthetical remarks") increased steadily in normally developing children from kindergarten through twelfth grade. Starkweather (1987) characterized the use of these empty words as purposeful

and highly sophisticated discontinuities. They reflect experienced, coordinated language use. He further hypothesized that this skillful use of empty words/parenthetical remarks may become even more sophisticated in normal adults, because these structures are so pragmatically useful for holding a listener's attention and maintaining a conversational turn while planning the next communication unit.

It was also observed that Subject 1, in pretreatment baseline, customarily exhibited protracted silent pauses before beginning his responses, particularly in the picture-elicited narrative task. It was easy to imagine Subject 1 using this behavior in his classroom, and quickly losing his chance to respond because he had given the teacher no indication as to whether or not an answer was forthcoming! By the posttreatment baseline, Subject 1 habitually began his responses much more quickly, using empty words to gain time while he planned what to say. From Starkweather's perspective, the changes exhibited by Subjects 1 and 3 seem quite positive.

Another notable shift was the considerable decrease in revision behavior exhibited by Subject 3. As indicated earlier (see Results), one important reason for this change was that Subject 3 seemed to acquire a more proficient usage of pronoun referents between baselines. This is interesting in terms of how word knowledge is measured.

The fact that Subject 3 was able to point appropriately to picture representations of various pronouns on a test of one word vocabulary, could lead an examiner to conclude that he understood pronoun concepts. As Norris & Bruning (1988) reported, this type of test gives no information about a child's comprehension of pronouns as referents in printed text. The same statement can be made about children's pronoun use in spoken discourse. Subject 3's initial performance on discourse tasks clearly manifested his inflexible, almost groping use of pronouns. His communication units, especially during story-retelling, were full of pronoun revisions as he struggled to select the correct forms and build a cohesive narrative. In the posttreatment baseline, Subject 3's use of revisions had decreased by 16%, and the transcribed data reflected a more comfortable, skillful use of pronouns.

It should be emphasized that Subject 3, almost without exception, would ultimately select appropriate target pronoun forms without direct instruction from the examiner. He often produced little strings of pronouns, briefly hesitating between attempts, until he was satisfied with his choice. Feedback from the examiner generally consisted of brief comments or nods that merely confirmed the suitability of the chosen pronoun. How, then, did Subject 3 become more proficient at using pronouns as referents in discourse? It is possible that he benefitted from simply

being afforded the daily (albeit abbreviated) opportunity to formulate and produce higher level discourse, without fear of interruption, ridicule, or failure.

Researchers have documented that even normally developing children have few opportunities to engage in valuable, interactive discourse during the school day. It has been reported that the average talking time is less than two minutes per child per day (Allington, 1989). Unfortunately, LLD students may have even fewer chances to talk. Their school days may be highly fragmented, leaving little time for discourse interactions of any depth. In large group instruction, LLD students may not have many opportunities to practice and refine their discourse skills. Teacher-directed "discussions" usually result only in brief answers (Norris & Hoffman, 1993). In addition, if an LLD student does have a chance to make a comment or ask a question in class, the resultant discourse may be virtually undecipherable because of discontinuities and repair behaviors. The teacher may move on to the next student with a raised hand, and avoid calling on the LLD student in the future (Norris & Hoffman, 1993).

Rate of Response to Treatment

Casby's (1992) study included session by session documentation of his subject's progress, which revealed a gradual reduction in the time required to name the training items. The studies by McGregor & Leonard (1989) and Wing

(1990) do not provide any information regarding rate of response to treatment.

Of the three subjects involved in the present study, one (Subject 3), demonstrated a statistically significant decrease in overt word selection behaviors at the point of intervention. Subject 2 demonstrated a lesser downward shift that was not statistically significant, while Subject 1 actually exhibited a slight increase in target behaviors observed (also statistically insignificant).

Why did Subject 3 show a relatively immediate change? One possible explanation is his own style of responding to the examiner's feedback. The data showed that often after his first production of a target word, Subject 3 would build the word into his subsequent questions and comments. In this example from the transcript, Subject 3 treated the term "backbone" in such a way:

Experimenter: Well, sharks are kind of strange. They don't have a backbone.

Subject 3: Flat fish don't either. Fish do, though... Cars do.

Experimenter: A backbone?

Subject 3: (Laughs) There's their backbone...
There's my backbone right he-...
(feels his back) there. I can make
it stick out sometimes...Whenever I
tell someone hit me on here, they do...

My backbone go (sound effect)...

They could see my backbone, but I go
like that (gesture)...I push it back
in.

This proved to be an effective practice for Subject 3 for two reasons. First, by using the word in several different sentences, he allowed himself an opportunity for natural rehearsal, thereby increasing the likelihood that the word would be available for rapid, efficient selection in the future. In fact, some interventionists strive to provide redundancy by arranging opportunities for children to encounter the same concept many times, but in a slightly different context each time (Norris & Hoffman, 1993). Secondly, by structuring his comments around a particular, specific word, he reduced his number of overt word selection behaviors, which, in turn, improved his overall discourse fluency.

The fact that Subjects 1 and 2 did not exhibit an immediate response to treatment is not really surprising, considering the pervasive nature of LLD and the rather limited scope of these experimental intervention segments (15 minutes per day for five days, in a somewhat structured situation). Indeed, none of the subjects even performed above the 50th percentile on the PPVT-R (see Table 2), which is only a superficial measure of word knowledge. The subjects' slight upward and downward behavioral shifts can

be attributed to the day to day variability (i.e., discourse productivity and overt word selection behaviors) that was observable across the entire study. There is preliminary evidence, however, that further intervention of this type would yield positive results. Midway through the treatment phase, Subject 1 began to demonstrate similar, although not as consistent, behavior. The following is an excerpt from a picture-elicited narrative produced by Subject 1.

Subject 1: Um...(pause) It looks like they're catchin' flillies...and um...

Examiner: Are they flies?

Subject 1: I mean, not flies...butterflies...He's lookin' at a uh... at the butterflies... um...and uh...um...sh- her...shhhhhhhe is um...shhh...she is catchin a butterfly...um and she's holdin' a butterfly

Task Complexity

The issue of linguistic task complexity was not discussed in the three preceding treatment studies. Picture naming (addressed in all three investigations) and word recall (addressed by McGregor & Leonard only) were the only tasks involved, and there was no mention of the possibility of integrating these skills into a functional language system.

Inspection of the plotted data from the present study revealed that the three discourse tasks were apparently of unequal complexity, and this proved to be statistically true for two of the subjects. The transcripts of the story-retelling narratives of all three subjects contained many more overt word selection behaviors than could be observed in the other two tasks.

Without the shared picture context that was available in the picture-elicited narrative task, or the degree of mutual topic familiarity inherent in the conversation task, it was necessary for the subjects to make specific word choices to convey meaning. For this reason, the story-retelling task was a much more difficult challenge that resulted in a high percentage of overt word selection behaviors, and was not directly comparable with the other two tasks. These findings support those of other studies that have linked increased linguistic complexity with nonfluent or discontinuous speech (e.g., Gordon, 1982, in Starkweather, 1987; Muma, 1967, in Starkweather, 1987).

Word Selection in Context

In the three earlier studies, subjects were chosen based on observed difficulties generating appropriate words, not only on tests of confrontation naming, but in natural communication situations as well. Curiously, there was no information included in any of these reports

regarding subjects' use of training words in complex discourse structures.

For all three subjects involved in the present study, above average length communication units resulted in significantly higher percentages of speech discontinuities, including overt word selection behaviors. Investigations that have focused on speech fluency have produced similar results (DeJoy & Gregory, 1973, in Starkweather, 1987; Haynes & Hood, 1978). Longer units are more demanding in terms of both linguistic and motor speech production. Moreover, long units are almost always more semantically complex than short ones (Starkweather, 1987). Presumably, these longer, more complex communication units also impose stress on the process of on-line word selection in all speakers. For students with LLD, including these subjects, longer units are particularly challenging.

Limitations

The four treatment studies in this area have all been limited by small numbers of subjects. The current investigation involved only three students, McGregor and Leonard had two, and Wing used two groups of five to compare separate treatments. Casby's single subject, as mentioned previously, cannot even be considered a member of the LLD population due to his history of early neurological involvement. Perhaps subjects were scarce because a major criterion for participation in each study was poor

performance on tests of picture naming. It is likely that many LLD students were adept enough at naming pictures to disqualify themselves from participation. Considering the information from this study, if more complex discourse tasks were part of the subject selection process, many more LLD students would qualify.

Another limitation of the present study is that its 25 sessions were not enough to allow observation of ongoing word selection development in the three subjects. All of the previous intervention studies were relatively short as well: McGregor and Leonard used 12 sessions, Casby used 15, and Wing used 30. Since these researchers were working with closed sets of training words, it was not necessary to continue once the subjects were able to name those pictures efficiently. In future research with the experimental treatment being presented here, data should be collected over a longer period so that the process of improving word selection proficiency could be observed more fully.

Theoretical Considerations

Given the findings described above, it is appropriate to evaluate the theoretical bases underlying the various treatments. All of the researchers interested in treating children's word finding have presented their beliefs regarding cause. These beliefs can be summarized as follows:

- (1) Children's word finding problems are due to ineffective access/retrieval strategies.
- (2) Children's word finding problems are due to poorly elaborated lexical entries.
- (3) Children's word finding problems are due to the combined effect of ineffective retrieval and poor storage.

The following section will begin with descriptions and critiques of the theoretical underpinnings of each of the previous intervention studies in this area. It will be argued that it is unproductive to continue to think about children's word selection in terms of access and storage. An alternate set of beliefs will then be presented.

Word Access/Retrieval

Wing (1990) seemed convinced before and after her study that, at least for some children with LLD, faulty word retrieval processing (i.e., an access disorder) was chiefly to blame for word finding problems. She based her retrieval treatment on a model of children's word finding developed by Wolf (1982, 1984), that involved successive stages of (1) stimulus perception, (2) conceptual recognition and categorization, (3) lexical search, and (4) motor activation/production. A breakdown at one or more of the four stages was thought to result in a word retrieval problem. There are problems with this reasoning, because all of the proposed stages necessarily involve word

storage. If a child is unable to functionally use a particular word, it could be that the concept and its label were sketchily stored in the first place. For example, if a child "learned" a science term from a worksheet, with no real discussion or experience of its meaning, the term may not be easy for the child to produce in response to his teacher's question a day or two later. It would not be appropriate to say that this child exhibited a pure retrieval problem.

Word Storage/Elaboration

Casby (1992) strongly supported the notion that LLD students have poorly elaborated semantic entries (i.e., a storage disorder) that result in word finding difficulty. He designed his elaboration treatment based on his interpretation of a levels-of-processing memory framework developed by Craik and Lockhart (1972). According to this model, memory of a word is affected by the "depth" to which that word has been processed by a learner, and the "deeper" the processing, the more effective the storage.

It makes sense to say that effectively stored words should be more easily accessible. However, since Casby was concerned with picture naming, he failed to mention that contextual variables have an enormous effect on a child's ability to functionally select specific words (Norris & Hoffman, 1993). Words that are readily available when a picture stimulus is present, and/or when only a label is

required (as in most naming tasks), may be frustratingly unavailable for use in complex, decontextualized discourse. In the example provided above, the child had not learned the science term thoroughly enough to functionally respond in class, but may have been able to name the item given a picture cue. Ease of word access is inextricably tied into quality of elaboration, and is positively or negatively affected by contextual variables. It would not be accurate to attribute an LLD child's word selection difficulties to storage alone.

Retrieval and Storage Combined

Although they did not refer to a specific theoretical model, McGregor and Leonard (1989) argued that children's word finding difficulties may stem from a combination of both sources, and they interpreted their experimental data to suggest that activities focusing on both storage and retrieval were most productive. They compared their work to that of Kall and Leonard (1986), who found no cases of pure retrieval deficits among their subjects. McGregor and Leonard noted that although their LLD subjects sometimes exhibited evidence of retrieval deficits, they always demonstrated accompanying elaboration problems.

All of the intervention studies of children's word selection processing, including the present one, have directly or indirectly provided evidence that word access and word storage cannot be neatly divided up and

effectively remediated as distinct entities. One telling fact is that researchers have not even agreed on what should constitute an "elaboration/storage exercise," and what activities should be considered helpful for access/retrieval (German, 1992). For example, in their treatment protocol, McGregor and Leonard included rhyming words as part of elaboration training, while Wing used rhyming as a retrieval activity. Conversely, McGregor and Leonard had their subjects provide attributes of training items as a retrieval exercise, while both Casby and Wing used the same activity to improve elaboration. This confusion helps to show that, at least for this population, access and storage should not be addressed separately.

An Alternate View

The constructs of word "storage" and "access" were first used by researchers attempting to describe the lexical processing of normal adults, and to explain symptoms affecting communication in adults with focal brain damage. In writings on the adult aphasic population, authors have discussed individuals who seemed to have impaired storage of certain established word representations or impaired ability to access those representations.

Very simply, some aphasics with focal lesions seem to lose functional use of many words that have served them well throughout their lives. The resulting word finding

behaviors may, at first, seem similar to those of LLD children. They hesitate, reformulate and produce substitute words or phrases instead of ones they apparently mean to use. Sometimes they produce real words that make no sense in the current context, and they may use forms that are not recognizable English words (i.e., neologisms). They frequently exhibit "groping" behavior as they try unsuccessfully to self correct. Even if their target words are repeatedly modeled for them, and even if rich cues are provided, members of this segment of the aphasic population may consistently fail to use those words functionally.

It seems unproductive to go on discussing LLD students in terms of "storage" and "access." The ones involved in this and previous studies have not behaved very much like adult aphasics with focal lesions. The current subjects did substitute alternate words for target words, but their substitutions were generally their best available approximations of various targets (e.g. "undercover" for detective, "water stuff" for a hair product, and "opening thing" for grating). They did not produce neologisms, but they did use immature forms that were phonologically similar to their targets (e.g., "Mapachusa" for Massachusetts, "chacks" for tracks, and "intentions" for detentions). They often self corrected. They did not demonstrate the "groping" behavior sometimes seen in adult

aphasics with focal lesions, but they frequently produced strings of forms that successively increased in specificity (e.g., "them...these people...a mother and a child...two, mother and two kids"). In addition, and in great contrast to many aphasic individuals with focal lesions, these subjects were generally able to use a target word for the rest of a discussion once they had produced it successfully.

Unlike neurologically impaired adults, LLD children appear to possess a large number of word representations that are not and have never been well established. They have not retrieved these words successfully for ten, twenty, or thirty years. Their concept development is in process. This is why they fail to use certain words functionally, even during simple picture naming tasks. The current study showed that on-line word selection during discourse production was a challenge for LLD subjects. Because their language systems were not very flexible, extra learning time and/or intervention was required before they could acquire enough information about words to use them functionally for real communication purposes (Norris & Hoffman, 1993). It seems that until sufficient concept development occurs, LLD children will experience difficulty using words in discourse, especially in decontextualized situations when external cues are unavailable. The overt word selection behaviors they exhibit should not be viewed

as "word finding" problems, but simply as symptoms of their generalized language deficits. Moreover, as demonstrated by this study, the symptoms can seem very mild or quite severe depending upon the demands of the linguistic task at hand.

Implications

The results of this investigation have implications for future research as well as clinical intervention. In this section, these issues will be addressed in turn.

Future Research

As mentioned earlier, the entire body of research on the word selection difficulties of LLD children is limited by the small number of subjects who have participated in experimental treatments. A more ideal study could be constructed by involving groups of LLD students from several schools. Baseline measures would include samples of each student's performance on linguistic tasks that reflected a range of contextualization and complexity. To achieve maximum cost and time effectiveness, classroom teachers and speech-language pathologists could be trained to work collaboratively to provide the necessary components of the treatment: (1) frequent opportunities to engage in discourse, and (2) the feedback necessary to assist students through each word selection process. At intervals, discourse samples would be collected, and

progress would be evaluated based on observable shifts from baseline performance.

Clinical Intervention

This study demonstrated that LLD students benefit from (a) being allowed to engage in discourse, and (b) meaningful feedback. It seems that the most effective intervention program would incorporate these two elements as much as possible throughout the school day.

Fortunately, many educators are now embracing the Whole Language philosophy of learning (Goodman, 1986; Norris & Hoffman, 1993). Educational strategies associated with Whole Language include multiple opportunities for students to engage daily in various types of discourse. The practice of organizing curricular material along thematic lines is particularly beneficial because there are multiple built-in opportunities for discussing many angles of a central topic. Instead of being trained to recall isolated words during one or two weekly therapy sessions, students are able to gain experience in integrating relevant vocabulary into large, meaningful discourse structures frequently during each school day. This purposeful redundancy is invaluable in meeting the language needs of LLD students (Norris & Hoffman, 1993).

Recent federal mandates require teachers and other service providers (e.g., speech-language pathologists, reading specialists) to begin to work collaboratively.

There have been concerns about cost effectiveness and prudent use of instructional time, and the disadvantages of fragmenting the school day are now better understood (Craighead, 1991; Damico & Nye, 1991; Norris & Hoffman, 1993). Speech-language pathologists could assist classroom teachers in the restructuring of instructional time to allow more frequent discourse opportunities. These professionals could work together to provide the moment-to-moment feedback utilized in this study. Educational paraprofessionals (i.e., teacher aides) could be trained to provide this type of feedback in supervised contexts. It is also possible that, after a short time, the higher-achieving students in a class would assimilate the feedback strategies well enough to implement them as peer leaders of cooperative learning groups. In this way, students' word knowledge could be improved in a richly networked, efficient, cost-effective manner. Such whole learning organization offers the best hope for students with language-learning disorders to improve their word selection proficiency, and, as a result, their discourse fluency.

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APPENDIX A
PARENTAL PERMISSION FORMS

Date:

Dear Parents of _____:

Your child may be eligible to participate in a research project taking place in St. Tammany Parish Schools this fall. I am hoping to discover a better way to educate students who have language and learning problems. The purpose of the study is to work on improving children's language while they are engaged in different types of natural language activities.

To find out if your child is eligible, I will need to take several samples of his/her language, and to administer some standardized tests that will take about one hour to complete. This testing would take place during the school day at the most convenient time for your child and his/her teacher. Both the language samples and the test will be audio-tape recorded for analysis.

If your child is invited to participate in the study, there will be no risk involved. The experimental language work would take place at his/her regular speech therapy time, so the daily schedule would not be interrupted. All information collected, including the audio-tapes, will be kept strictly confidential, and identified by a number only.

If you sign this form, you are agreeing only to preliminary testing to determine eligibility. If your child is selected, you will be asked to sign a second form granting permission to participate.

If you have any questions, please feel free to contact me at the numbers below. Thank you for considering this project.

I CONSENT TO PRELIMINARY TESTING TO DETERMINE MY CHILD'S ELIGIBILITY FOR A LANGUAGE RESEARCH PROJECT. I UNDERSTAND THAT IF MY CHILD IS INVITED TO PARTICIPATE, I WILL BE ASKED TO SIGN AN ADDITIONAL FORM.

Date

Parent/Guardian Signature

Researcher: Lillian N. Stiegler, M.C.D.
892-4311 or 893-2859

Date:

Dear Parents of _____:

Your child is invited to participate in my language research project for the fall. As indicated in the first letter, I would like to study a new way to improve the verbal expression of students who have language and learning problems. I am hopeful that this new approach will benefit students by enhancing their classroom performance in activities requiring oral language.

I can offer you the following assurances:

1. There is no risk involved for your child.
2. Your child's daily schedule will not be interrupted.
3. All information collected will be confidential.
4. Participation in the study is voluntary.
5. You are free to withdraw your consent at any time.

If you choose to allow your child to participate, please sign and return this form. Contact me at the numbers below if you have any questions. Thank you for your time and interest.

I VOLUNTARILY GIVE PERMISSION FOR MY CHILD TO PARTICIPATE
IN A LANGUAGE RESEARCH PROJECT.

Parent/Guardian Signature

Date

Researcher: Lillian N. Stiegler, M.C.D.
892-4311 or 893-2859

APPENDIX B

DESCRIPTIONS OF STIMULI FOR PICTURE-ELICITED NARRATIVES

1. A boy is at the doctor's office, mother and nurse are nearby, doctor approaches with a hypodermic
2. Two children are crossing the street on their way to school, the crossing guard holds a stop sign, an approaching car splashes water on all
3. Four boys are going fishing, two of them look for worms under a rock and find a frog instead
4. Four children are playing in water from a lawn sprinkler, their clothes are wet, a mother looks on with an angry expression
5. Three boys are in a video arcade, one is playing a game, two are fighting, the manager approaches
6. A boy is feeding one of his pet rabbits while looking at a dog, two boys with mischievous expressions remove another rabbit from its cage
7. Three adults and one child are working in a vegetable garden, the child has a hoe, the woman is shucking corn, the two men are gathering vegetables
8. Four children are buying ice cream from a vendor, one of the children has spilled ice cream on his shirt

9. A kitten is stuck on a tree limb, a girl and a man are looking up at the kitten, another man approaches with a ladder
10. A boy is learning to ride a bicycle, a man is helping, a doll is sitting in the bicycle's path, a girl approaches with a roll of bandages and a tube of cream
11. A girl is catching a butterfly in a net, another girl is holding a butterfly, a boy is looking at two butterflies in a jar
12. Three boys are wearing baseball uniforms, one boy is carrying an equipment bag, the bag has a hole, two balls and two bats are falling out, the coach is calling them
13. A paper boy is being chased by a dog, a cat with an angry expression crosses the dog's path, two older girls carrying books look on
14. A boy is sitting on the ground and crying, his knee is bleeding, he is holding a broken toy boat, another boy and a woman approach
15. Two boys are building sand castles in a sand pile, a baby with a shovel is approaching the castle, a small boy and a woman approach

16. Four boys are trading and/or selling toys, one has a baseball glove, one has money, one has a harmonica, one has an airplane

17. A woman is walking with her two young children, the children are frightened by a barking dog, a man approaches the dog

18. A woman is grocery shopping, two boys knock over a display of cans, the store manager looks on with an angry expression

19. Four boys are camping, a tent is in the background, two of the boys are building a fire, one is rolling out a sleeping bag, one is holding a hammer and a tent stake

20. Three boys are playing basketball, the ball bounces into the street, a boy is running after it, a car approaches

21. Four people are at a laundromat, a man is putting clothes in a dryer, a woman and a girl are folding clothes, a boy is walking and unknowingly spilling his box of detergent

22. A boy is doing homework in a family room, a younger boy is beating a drum, a baby is crying, a television is on, a man is gesturing at the boy with the drum, a woman is speaking to the boy doing homework

23. A woman is grocery shopping, two boys are filling a bag with fruit, some of the fruit has fallen on the floor, a man is slipping on the fruit

24. A boy is scooping hay with a pitchfork, a man approaches with a worried expression, another boy is feeding chickens

25. A boy and a girl are playing dress-up, they are fighting over a shirt, a man and a woman approach with angry expressions

APPENDIX C

CONVERSATION STARTERS USED AS STIMULI

1. I wanted to buy a bird cage for my son. We went to the White Elephant Store in Abita, but they didn't have any bird cages. Then we were going to K-Mart to see if they had bird cages for low prices, but we saw a man on the side of the road selling junk. He had three bird cages! We bought one for 15 dollars.

2. Yesterday, after school, my six year old son came up to me, crying. He said when he was on the playground, a big boy took away his little Darkwing Duck toy and the hood of his Jacket. We looked all over the playground for those things, but we couldn't find them anywhere.

3. Did you see those huge sinkholes on the playground? The other morning, I was on duty when that little kindergarten boy fell in the hole. Did you hear about it? It was scary. He could have broken his leg...or something worse! I'm glad they're fixing it now.

4. About a week ago, my son was fishing in our pond, and he caught a big snapping turtle about this big. It was just hanging on the end of his line -- His daddy had to help him get it off and throw it back in the pond.

5. I took my kids to get their hair cut the other day. My littlest boy moved his head when the lady was cutting his bangs, so she accidentally snipped off too much...then she had to cut it very short so it wouldn't look all chopped up.

6. Over the holidays, I went to visit my sister in Tennessee. We drove for 8 hours to get there. Once, while we were there, it snowed. The snowflakes melted as soon as they touched the ground, though. It wasn't really cold enough for the snow to pile up.

7. Guess what happened to me one time. I had something cooking on the stove, and I went to feed my baby in the other room. I fell asleep. Pretty soon, the smoke alarm woke me up, and the pot was on fire on the stove. Lucky I had that fire alarm. I ended up having to throw the pot away.

8. I went to this football game, and when we went in, everybody got a paper airplane. They parked three brand new cars on the field, and opened the windows. Everybody had to try to throw their plane into a window. If they got it in the window, they won the car!

9. When I had this red van, one time it had car trouble and stopped right on the Causeway Bridge. Cars were coming so fast, and I was really scared because I thought someone

would crash into my car. Finally, the bridge police came and pushed me off the bridge. (Note: The last statement in this starter was too ambiguous, and all three subjects were confused by it. I had to add, "They used the police car's bumper to push my van to the end of the bridge.")

10. Last night, we went to the Saints game against Atlanta. I thought the Saints would win easily, but they couldn't make touchdowns, only field goals. I felt so nervous...like I was going to have a heart attack! Finally, the Saints won. I was so glad.

11. This weekend we went to a bird fair in New Orleans. There were thousands of birds -- all different kinds. It was so crowded, we could hardly walk. My son bought a cockatiel. He can whistle "When the Saints Go Marching In" and "Jingle Bells."

12. A little while ago, I was doing speech with the kindergarteners. We had 21 kids, and we were talking about flying, so I had to make 21 paper airplanes. My hands were so tired.

13. Our church has a nativity scene set up. Some of the ladies were decorating the church for a Cajun Christmas, and when I looked in their nativity scene, I noticed they had a donkey, a sheep and an alligator! That was funny to see an alligator by Baby Jesus.

14. I went out Christmas shopping for my three year old nephew. He wanted some toy reptiles to go with his reptile book. I went to one store and bought a snake and an alligator, but I couldn't find a turtle. Finally, yesterday, I found a toy turtle.

15. Today I saw a picture of the wierdest animal. It was a mole...you know the kind that makes underground tunnels? But this mole had this thing on the end of his nose that looked like a little, tiny hand with about ten fingers. The book said it was a star-nosed mole. It was so strange.

16. My son went to a birthday party at BJ's Pizza on Saturday night. We had to rush to the toy store and buy a present on the way to the party. It was a girl's party, so we bought a little troll doll and a troll pencil.

17. I watched the Christmas program this morning. It sure was crowded in that gym, but I thought the kids did a really good job anyway. The parents seemed like they enjoyed it.

18. Today we ate out in a restaurant. The waiter kept bringing five things for six people. He only brought five iced teas, five salads -- I wanted to tell him, "Hey, look! We have six people!"

19. I am so glad that the United States is helping bring food to the people in Somalia. They have been starving to death over there. In the paper, it said that lots of children are orphans now because their parents died of hunger.

20. Last night, my little boy went to curl the ribbon on one of the presents I was wrapping. I told him to be careful, but the scissors slipped, and he cut his finger. It was bleeding all over the place, and he was screaming.

21. My boys were really excited at Christmas time. One got a Super Nintendo, one got a bike, and one got a whole bunch of Ninja Turtle stuff. They had a great time during the holidays.

22. My sister is getting ready to have a baby. She already has a girl and a boy, so this baby will be number three. Her belly is getting really big, because the baby is coming in about two more weeks.

23. I took my white clothes to the laundromat. When I got them out of the washing machine, they had little greenish spots all over them. It looked like green ink. And I tried and I tried, but I couldn't get the stains out. I wonder what happened.

24. I saw a good movie over the holidays: Aladdin. My favorite character was the genie. He could change his looks and his voice so easily. I really liked it when he changed into a fat lady.

25. Pretty soon, it will be Mardi Gras time. My whole family dresses up every year. One time, we were cave men, one time, waiters, one time, roaches. I don't know what we'll be this year.

APPENDIX D

SAMPLE TRANSCRIPTS FROM INITIAL BASELINE

Task A: Picture-Elicited Narrative

Clinician: I want you to look at this picture and tell me a story about what's happening.

Subject: Th- They're all having fun gettin wet and uh ts and that and their mom's mad um 'cause they're gettin all wet (pause) and he's takin off his socks (points) because he got em wet (pause) and they're playin tag (points) (long pause) And that's all.

Clinician: Can you see anything else in the picture that you could add to your story?

Subject: And they all barefoot (long pause) And 'cept he he has one uh (pause) sssomethings somethin at the bottom of his pants That's all And he- he's wearin sho- shorts and they ain't wearin shorts That's all

Task B: Story-Retelling Narrative

Clinician: (reads story) So go ahead and tell the story.

Subject: Uh they all um ts uh h- he- she uh she followed she went back to the corner then she seen him um him cuttin grass and she thought he can cut grass and

talk so she went and followed him around while he was workin and um sh- um and the boys uh checked out um out the corner in and off and uh in and off and um they saw they uh started gettin tired not Janice and um Janice went back and she seen a big ol' dog house and um she went um over there no- and she said that i- and she shouted out ya'll gettin a dog? big dog? And he said n- uh nnno uh that's sure that um he's paintin that for somebody else a- you wanna help paint? so Janice helped him paint and um ts and then um um she kept thinkin um that uh um (pause) he- if he was holdin on somethin that um that holdin on somethin then um (long pause) that dad and him was um holdin somethin in on em Hm And that's all.

Clinician: Okay. Can you think of anythin else from the story that you could add?

Subject: Uh ts like ah ah (shakes head)

Task C: Conversation on a Familiar Topic

Clinician: Listen to this. About a week ago my son was fishing in our pond, and he caught a big snapping turtle about this big. It was just hanging on the end of his line, and his dad had to help him get it off and let it go back in the pond.

Subject: NR

Clinician: Do you know what I'm talking about? Have you seen those big snapping turtles?

Subject: Yeah.

Clinician: They have those points all over their shells.

Subject: (nods) I seen a boy and he had one before But he had a little one He didn't have a big one He had it in a bucket

Clinician: And it was like a pet?

Subject: They just caught it was in like a (gestures) white bucket I I don't know what he did with him

Clinician: Hm.

Subject: Probably put it back

Clinician: Do you fish?

Subject: Yeah I like to fish I love animals but I hate sometimes I don't like fishin because um it whenever the hook gets in the fish's mouth (disgusted facial expression)

Clinician: Think that's gross?

Subject: (nods)

Clinician: I don't like fishing because you have to wait. You have to just sit there and wait a long time before a fish comes

Subject: (nods) We- my aunt Pat used to have a big, big, big, big pond and we used to uh take bread and feed em and all and sometimes whenever we wanna go fishin we'd take the bread we'd do that sometimes and uh couple days if we'd wanna go fishin we'd take some more bread and put it out and we'd uh take our fishin pole put bread on it and whenever uh uh the they gettin the bread and they get that one (gestures) and then you just pull em up (gestures)

Clinician: Yeah. That's pretty tricky

Subject: We get em good too

Clinician: Hm. What kind of fish does she have, do you know?

Subject: Ah ah

Clinician: Are they the kind you can eat?

Subject: (shrugs)

Clinician: Do you save em and eat em or do you just throw em back?

Subject: We throw em back 'cause well we we never caught no bigger ones big bigger ones just about that size (gestures) we never caught no big ones that we would wanna eat we always used to eat fish but we used to buy it and eat it but now she sold it

Clinician: Oh, she sold her pond

Subject: Cause it was a she sold her whole property s- she had a whole bunch a acres of land she used to have cows and all but we only seen her cows before because she sold her um all of her animals

Clinician: Hm.

Subject: And sh- and she uh the uh and she uh used to uh take a uh l- um uh cow cause they used to have a some cows and used to she used to take a cow but I wasn't born and she um would uh take it to the um What do you call them people who chop up the cow and meat

Clinician: Like a butcher?

Subject: Yeah something like that

Clinician: A slaughterhouse?

Subject: Yeah a slaughterhouse and that's what my mom said and they would divide her up and they would take it um home and eat it (disgusted facial expression) and my

mom didn't wanna eat it and then she kept her and her um
cousin always cried they said

Clinician: Hm.

Subject: Cause it was one of the baby cows like it
well it wasn't that much of a baby then uh it but it
used to be a baby around uh whenever they had it they
raised it and all my mom don't like eatin somethin that
she raised or nothin

VITA

Lillian Nielsen Stiegler graduated with honors from Nicholls State University in Thibodaux, Louisiana in 1979 with a B.A. in Speech, Language, and Hearing. In 1982, she completed requirements for a Master of Communication Disorders degree from Louisiana State University Medical Center in New Orleans, Louisiana. She received the ASHA Certificate of Clinical Competence in 1983.

For twelve years, Mrs. Stiegler practiced as a speech-language pathologist in three parish school systems in Louisiana. She provided assessment and intervention services to students from diverse clinical populations including the hearing impaired, mentally handicapped, severe language disordered, noncategorical preschool handicapped, and those using various augmentative communication systems. She supervised clinical practice for undergraduate and graduate students from Southeastern Louisiana University. In addition, she shared clinical information with colleagues and the public by presenting at conferences, participating in parent training programs, and editing newsletters.

For three years, she was the part-time employee of a local private practice. She provided speech-language pathology services to neurologically impaired adults in area hospitals and home settings.

In 1989, Mrs. Stiegler enrolled in the speech-language pathology doctoral program at Louisiana State University. During her residency year, she served as a research assistant, with duties that included video data collection, computer data entry, and the supervision of graduate students. As a teaching assistant, she taught a course in children's phonetic disorders.

Mrs. Stiegler resides in Covington, Louisiana, with her husband and three sons. Her family enjoys participating in Mardi Gras and cheering for the New Orleans Saints, and they have a keen appreciation for excellent comedy.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Lillian Nielsen Stiegler

Major Field: Communication Disorders

Title of Dissertation: Enhancing Discourse Fluency by Increasing
Word Selection Proficiency in School-Age
Children with Language Learning Disorders

Approved:

Burt E. Hoffman
Major Professor and Chairman

George F. Voyce
Dean of the Graduate School

EXAMINING COMMITTEE:

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Date of Examination:

March 16, 1994