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THE VERBAL BEHAVIOR OF STUDENTS WITH LEARNING DISABILITIES DURING READING INSTRUCTION WITH THE LANGUAGE EXPERIENCE APPROACH AND TWO MASTERY LEARNING PROGRAMS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

By

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The Ohio State University

1986

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Patricia M. Daly
1986
To my mother and in memory
of my father, for their enduring
love and support
ACKNOWLEDGEMENTS

To the members of my committee I extend a special thanks: To Dr. Timothy Heron, for his thorough reading and thoughtful editorial comments; to Dr. Daryl Siedentop, whose classes provided a most stimulating and challenging environment; and to Dr. John Cooper, who introduced me to the study of verbal behavior, and who has been a model teacher and professional for me since I met him in 1981. The conceptualization of the idea, and the quality of the document reflect his influence strongly.

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Finally, to Mary O'Sullivan, friend and colleague, a
sincere thank you for her continual support, friendship, patience and encouragement, and above all, for her faith in me, without which I would never have started.
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PUBLICATIONS


FIELDS OF STUDY

Major Field: Mildly Handicapped

Applied Behavior Analysis
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEDICATION</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>VITA</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>xi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>xiii</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td><strong>I INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>Instruction and the Language Experience</td>
<td></td>
</tr>
<tr>
<td>Approach</td>
<td>4</td>
</tr>
<tr>
<td>Instruction and Mastery Learning</td>
<td>8</td>
</tr>
<tr>
<td>(DISTAR)</td>
<td></td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>10</td>
</tr>
<tr>
<td>Research Questions</td>
<td>11</td>
</tr>
<tr>
<td>Definitions</td>
<td>11</td>
</tr>
<tr>
<td><strong>II REVIEW OF THE LITERATURE</strong></td>
<td>18</td>
</tr>
<tr>
<td>Verbal Behavior and an Operant Account of Human Behavior</td>
<td>18</td>
</tr>
<tr>
<td>Definitions of Verbal Operants</td>
<td>20</td>
</tr>
<tr>
<td>The mand</td>
<td>20</td>
</tr>
<tr>
<td>The tact</td>
<td>21</td>
</tr>
<tr>
<td>The echoic</td>
<td>22</td>
</tr>
<tr>
<td>The textual</td>
<td>22</td>
</tr>
<tr>
<td>The intraverbal</td>
<td>23</td>
</tr>
<tr>
<td>The autoclitic</td>
<td>23</td>
</tr>
<tr>
<td>The audience variable</td>
<td>24</td>
</tr>
<tr>
<td>Verbal Behavior and Research</td>
<td>25</td>
</tr>
<tr>
<td>Hypothesis Testing from Verbal Behavior</td>
<td>26</td>
</tr>
<tr>
<td>Stimulus control</td>
<td></td>
</tr>
<tr>
<td>Contingencies of reinforcement</td>
<td>28</td>
</tr>
<tr>
<td>Listening and speaking repertoires</td>
<td>29</td>
</tr>
<tr>
<td>Interpretive Applications to Maladaptive Verbal Behavior</td>
<td>32</td>
</tr>
<tr>
<td>Verbal Behavior and Socially Significant Behaviors</td>
<td>35</td>
</tr>
</tbody>
</table>
Descriptive studies ...................... 36
Experimental studies .................... 41
Verbal Behavior and Instruction ............ 49
Teaching methods .......................... 50
Instructional design ........................ 52
Summary ......................................... 58

III METHODS AND PROCEDURES ......................... 61

Participants ................................... 61
Setting ......................................... 63
Teacher ........................................ 63
Definition of the Dependent Variables .... 64
Measurement of the Dependent Variables .. 68
Reliability and Accuracy of Measurement .... 70
Independent observer ........................ 72
Training ....................................... 72
Procedure ..................................... 73
Verification of the Independent Variable .. 74
Materials ....................................... 74
Procedures ..................................... 75
The language experience approach -
descriptive .................................... 75
Session one .................................... 75
Session two .................................... 75
Session three .................................. 75
Mastery learning method - descriptive .. 77
The language experience approach -
baseline ....................................... 78
Language experience approach -
intervention .................................. 78
Social Validity .................................. 79
Maintenance .................................... 80
Experimental Design .......................... 80

IV RESULTS ........................................... 82

Accuracy Measures ............................. 82
Timing .......................................... 82
Accuracy of the transcripts .................. 83
Accuracy of verbal operant count .......... 83
Interobserver agreement on verbal
operators in transcripts ...................... 83
Verification of Procedures .................... 85
Research Question One ....................... 85
Percentage of the Story Read Non-
Echoically: Participant A .................. 93
Percentage of the Story Read Non-
Echoically: Participant B .................. 93
<table>
<thead>
<tr>
<th>F</th>
<th>Teacher Interview</th>
<th>195</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Language Experience Stories</td>
<td>199</td>
</tr>
<tr>
<td>H</td>
<td>Sample Transcripts</td>
<td>223</td>
</tr>
</tbody>
</table>

LIST OF REFERENCES                          233
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>3</td>
<td>84</td>
</tr>
<tr>
<td>4</td>
<td>86</td>
</tr>
<tr>
<td>5</td>
<td>87</td>
</tr>
<tr>
<td>6</td>
<td>88</td>
</tr>
<tr>
<td>7</td>
<td>97</td>
</tr>
<tr>
<td>8</td>
<td>98</td>
</tr>
<tr>
<td>9</td>
<td>99</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>11</td>
<td>101</td>
</tr>
<tr>
<td>12</td>
<td>102</td>
</tr>
<tr>
<td>13</td>
<td>103</td>
</tr>
<tr>
<td>14</td>
<td>124</td>
</tr>
<tr>
<td>15</td>
<td>126</td>
</tr>
</tbody>
</table>

- Table 1: Sex, Age, Grade, and Number of Hours Spent in the Learning Disability Resource Room.
- Table 2: Identification of Verbal Operants in Student Responses.
- Table 3: Interobserver Agreement Scores.
- Table 4: Percentage of the Story Read Non-Echoically for Participant A.
- Table 5: Percentage of the Story Read Non-Echoically for Participant B.
- Table 6: Percentage of the Story Read Non-Echoically for Participant C.
- Table 7: Percentage of the Story Read Non-Echoically by Participant.
- Table 8: Frequency of Verbal Operants Per Story for Participant A.
- Table 9: Frequency of Verbal Operants Per Story for Participant B.
- Table 10: Frequency of Verbal Operants Per Story for Participant C.
- Table 11: Duration of Story Reading Sessions for Participant A.
- Table 12: Duration of Story Reading Sessions for Participant B.
- Table 13: Duration of Story Reading Sessions for Participant C.
- Table 14: Frequency of Verbal Operants for Mastery Learning Decoding A.
- Table 15: Frequency of Verbal Operants for Mastery Learning Decoding B.
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Percentage Responses by Verbal Operant Per Story</td>
<td>131</td>
</tr>
<tr>
<td>17</td>
<td>Percentage of the Story Read Non-Echoically Per Session for Participant A</td>
<td>138</td>
</tr>
<tr>
<td>18</td>
<td>Percentage of the Story Read Non-Echoically Per Story for Participant A</td>
<td>139</td>
</tr>
<tr>
<td>19</td>
<td>Duration of Story Reading Sessions for Participant A</td>
<td>144</td>
</tr>
<tr>
<td>20</td>
<td>Frequency of Verbal Operants Per Story for Participant A</td>
<td>148</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>Participant A's percentage of the story read non-echoically per session</td>
<td>89</td>
</tr>
<tr>
<td>2</td>
<td>Participant B's percentage of the story read non-echoically per session</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Participant C's percentage of the story read non-echoically per session</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>Percentage of the story read non-echoically per session for three participants</td>
<td>92</td>
</tr>
<tr>
<td>5</td>
<td>Participant A's percentage of the story read non-echoically and rate of textual-intraverbal and intraverbal operants per session</td>
<td>105</td>
</tr>
<tr>
<td>6</td>
<td>Participant B's percentage of the story read non-echoically and rate of textual-intraverbal and intraverbal operants per session</td>
<td>106</td>
</tr>
<tr>
<td>7</td>
<td>Participant C's percentage of the story read non-echoically and rate of textual-intraverbal and intraverbal operants per session</td>
<td>107</td>
</tr>
<tr>
<td>8</td>
<td>Participant A's duration and percentage of the story read non-echoically per session</td>
<td>112</td>
</tr>
<tr>
<td>9</td>
<td>Participant B's duration and percentage of the story read non-echoically per session</td>
<td>114</td>
</tr>
<tr>
<td>10</td>
<td>Participant C's duration and percentage of the story read non-echoically per session</td>
<td>116</td>
</tr>
<tr>
<td>11</td>
<td>Percentage of total student responses by verbal operants for Mastery Learning Decoding A</td>
<td>127</td>
</tr>
<tr>
<td>12</td>
<td>Percentage of total student responses by verbal operants for Mastery Learning Decoding B</td>
<td>129</td>
</tr>
<tr>
<td>Figure</td>
<td>Participant A's percentage of total responses by verbal operants for language experience approach</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Participant B's percentage of total responses by verbal operants for language experience approach</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Participant C's percentage of total responses by verbal operants for language experience approach</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Participant A's percentage of the story read non-echoically per session</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Participant A's percentage of the story read non-echoically and rate of textual-intraverbal and intraverbal operants</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Participant A's duration and percentage of the story read non-echoically per session</td>
<td></td>
</tr>
</tbody>
</table>
Chapter I
INTRODUCTION

Skinner's contributions to education have been described as threefold: 1) the design and application of a technology of behavior in the classroom (i.e., behavior management); 2) the use of teaching machines to provide individualization of instruction; and 3) the design of programmed instruction (Tawney & Gast, 1984). Skinner described the role of the teacher as the arranger of "contingencies under which the student acquires behavior which will be useful to him under other contingencies later on" (1974, p. 202-203). Students are taught to behave in certain ways under training contingencies in order to make these forms of behavior more probable when the student comes into contact with maintenance contingencies. As such, educational practices teach new behaviors but are not concerned with their maintenance: "Education emphasizes the acquisition of behavior rather than its maintenance...Eventually, noneducational consequences determine whether the individual will continue to behave in the same fashion" (Skinner, 1953, p. 402). Skinner talked of verbal interpersonal interaction in terms of a speaker and a listener (or audience), "The speaker has many effects upon the listener. One of these may conveniently be called 'instruction'. The verbal stimulus generated by the speaker..."
alters the probability of a verbal or nonverbal response in the listener" (1953, p. 409-410). As "much of education is instruction in verbal behavior" (Skinner, 1974, p. 134), it is appropriate to focus on Skinner's description of verbal behavior and its influence or lack of influence on instructional practices.

The six verbal operants: mand, tact, intraverbal, textual, echoic and autoclitic, along with the audience variable comprise the structure of Skinner's description of verbal behavior. The account of verbal behavior is not derived from data on verbal behavior.

The emphasis is upon an orderly arrangement of well-known facts, in accordance with a formulation of behavior derived from an experimental analysis of a more rigorous sort. The present extension to verbal behavior is thus an exercise in interpretation rather than a quantitative extrapolation of rigorous experimental results.

(Skinner, 1957, p. 11)

Whereas principles of operant behavior are deductive in nature, verbal behavior, as an extension of those principles of behavior, was not empirically based.

McPherson, Bonem, and Osborne (1984) conducted a citation analysis of the influence on research of *Verbal Behavior*. They counted 836 citations for the period January 1957 to August 1983. However, it has been pointed out by Sundberg
and Partington (1982) in their lists of theoretical and applied references to *Verbal Behavior* that

Much of the applied work does indeed use behavioral principles and procedures to study language but... they fail to make use of a behavioral analysis of the contingencies involved for the individual speaker, thus, behavioral methods are often used to study traditional linguistic concepts, which are often irrelevant from Skinner's point of view. (p. 3)

Accordingly, McPherson et al. (1984) sorted their citations into descriptive, applied, and basic. They discovered that investigations employing (empirical) measures of at least one of Skinner's verbal operants, comprised only 31 out of 836 references. Experimental analyses amounted to only 19 studies.

The major studies which used special populations are described in the following chapter. Most of these studies used the categories of verbal operants when describing the dependent variable, but many did not use a behavioral analysis to explain results. The verbal operant categories most used were mands, tacts, and echoics. Examples of functional analyses of verbal behavior with the ultimate aim being the prediction and control of verbal behavior do not proliferate in the literature. Also, it was not possible to locate studies with instructional settings, which used
students with learning disabilities as subjects.

**Instruction and the Language Experience Approach**

A frequent concern in education is teaching reading to students who have been unable to learn this skill through methods such as the whole word approach, phonics, basal reader method, or any combination of these. A reading method used in some of these cases is the language experience approach. In this study, language experience as a method of teaching basic sight vocabulary words was defined as follows:

1. A stimulus (e.g., word, picture, question) is provided for a child with the objective that the child tell a story from his/her experience. This story is written down verbatim by the teacher.

2. The teacher reads the story with the child several times pointing to the words. The child is encouraged to read any parts he/she can remember.

3. In subsequent lessons the child can read more and more as he/she remembers more with repetition.

4. The teacher rewrites the story and cuts the rewrite into sentence strips. The child is given the task of putting the sentences in order.

5. Finally, the sentence strips are cut into individual words and are presented in the last lesson to the child as flashcards. Those words correctly identified by the child are retained in a file and a stimulus
for a new story is presented in the next lesson.

This method is one in which "instruction is built upon the use of reading materials created by writing down children's spoken language" (Hall, 1978, p. 2). Hall, in a comprehensive review of the literature on the language experience approach prior to 1978, left no doubt about the efficacy of the method or the directions future research might take.

The former research questions, 'Which method is best?' or 'Is the language experience approach effective?' are no longer appropriate ones...Instead, questions should examine the features of learning, teaching, and the learner that affect, or are affected by, elements of language experience programs. (p. 38)

Hall's (1978) major findings are presented below:

1. The language experience approach has been shown to be an effective method for teaching children to read.
   "There is research evidence to support that the overall reading achievement of students who receive language experience instruction is satisfactory, and, in some cases, it is superior to the achievement of children instructed by other approaches" (p. 24).

2. The language experience approach is used more frequently at the beginning stages of learning to read than at any other stage.

3. The language experience approach is a successful method for teaching vocabulary words.
4. Students for whom English is a foreign language have been motivated to learn to read English by using the language experience approach.

5. Adolescents with histories of reading problems, and adults labeled illiterate, have learned reading skills through use of the language experience approach.

The literature since 1978 contained several articles offering advice on how to use the language experience approach with various populations such as adults (Rigg & Kazemek, 1985; Wangberg, Thompson, & Levitov, 1984); adolescents (Lindsey, Beck, & Bursor, 1981; McWilliams & Smith, 1981); and primary students (Mallon & Berglund, 1984). This literature also described accounts of individual successes using the language experience approach (Richardson, 1981 - an adult illiterate; Epstein, 1981 - an adolescent; Stauffer, 1979 - a student with a hearing impairment; LaSasso - a student with a language handicap; and Wiseman, 1980 - a student with a learning disability).

Rationales provided for the use of the language experience approach for teaching reading appeal to linguistic theories most typically. Richgels (1981) described the importance of "metalinguistic ability" when learning to read. Metalinguistic ability was defined as "the mature speaker's ability to reflect upon language" (p. 49). Such "ability" enables a speaker to make judgments about grammar, ambiguity, and synonymity of utterances. A
reader with "metalinguistic ability" would have "cognitive clarity" about such concepts as "letter", "word", and "sentence". Richgels emphasized the differences between oral and written language and presented some evidence that greater similarity of "language patterns" between oral and written language facilitated greater gains by the children on reading scores. The language experience approach was proposed as a method which would effectively use student language patterns to teach reading, and "foster 'cognitive clarity' about such concepts as 'letter', 'word', and 'sentence', and how these elements look in written language" (p. 51).

Geoffrion (1982) cited psycholinguistic theory as a rationale for using the language experience approach with children with communication handicaps. The psycholinguistic interpretation describes reading as "the extraction of meaning through printed symbols" (p. 663). To facilitate this extraction of meaning a student has available a variety of cues. These cues include prior knowledge about a topic, linguistic knowledge, and orthographic knowledge (such as spelling and sound patterns). The language experience approach is posed as a method in which those cues could be more easily used by a student.

Socio-linguistic theory was the rationale provided for use of the language experience approach by Anderson (1984). Here, the emphasis was again on meaning. The student using
the language experience approach learns print "in meaningful language units" (p. 365). Because the print is a story dictated by the student, a meaningful situational context is created from which the child "learns to process print to construct meaning" (p. 365). As in the psycholinguistic theory, cues play a large part here where the student can predict, confirm, and correct hypotheses relating language to print.

It is clear that traditional interpretations of the language experience approach are not behavioral. In fact, the behavioral account of language was criticized as insufficient to explain the regularities in the development of language production (Richgels, 1981). It was the purpose of this study to develop a behavioral interpretation of the language experience approach, as such an interpretation is lacking in the literature and may provide some useful guidelines for teachers in the selection of students who might benefit most from this method.

Instruction and Mastery Learning (DISTAR)

The effectiveness of Mastery Learning programs (formerly called DISTAR) with their scripted lessons, rapid pacing and specific signaling and correction procedures, is well documented. As early as 1970, five years after the first kindergarten program was developed by Bereiter and Englemann, and one year after the introduction of the program known as DISTAR, the effects of this type of skill
teaching were shown to be very positive (Englemann, 1970). Results of an evaluation study indicated that disadvantaged students scored significantly higher on the Stanford-Binet I.Q. test (than prior to instruction) than those in the control group. The target subjects' achievement scores in reading, math, and spelling were significantly higher after instruction compared with those subjects not instructed using Englemann's methods.

A longitudinal study reported by Gersten and Carnine (1983) examined graduates of the Direct Instruction programs as they progressed through middle and high schools. Fewer of these students had dropped out of school, and in most communities, these students had maintained significantly higher reading scores.

Summarizing the findings of evaluations conducted from 1970 to 1983, Gersten, Carnine, and White (1984) stated that low income students taught using DISTAR programs performed better in tests of reading comprehension, math problem solving, and language than students taught using other methods. Furthermore, affective outcomes also favored the students taught through Direct Instruction methods.

Mastery Learning has been shown to be very effective in teaching many specific reading skills. Two programs in the Mastery Learning sequence were used in the setting selected for this study. Students with learning disabilities participated in these programs when a minimal basic
vocabulary was attained. It was one of the purposes of this study to assess the differences in the tasks set for the students using these programs compared to those using the language experience approach.

**Purpose of the Study**

It is not known whether the type of functional analysis advocated by Skinner in *Verbal Behavior* can be used successfully to describe and explain the instructional interaction known as language experience. Assuming the learning process of the student can be described and measured in this manner, it is not clear if or how this learning process (using the language experience approach) differs when a different reading method is used, i.e., Mastery Learning. Finally, many teachers do not use the language experience approach as it is considered time consuming and slow. Therefore, to be able to show an increase in the rate of learning by students through intervention on some aspect of the method would have social significance, particularly since language experience is often used only when other approaches have failed.

The major purpose of the proposed study was to test whether a behavioral analysis of language experience using the verbal operants defined in *Verbal Behavior* would provide more information on the learning process taking place. A second purpose was to see how this learning process description compared to one gained from the Mastery Learning
method. A final purpose was to investigate whether the acquisition of reading behavior by the student could be accelerated through intervention on the language experience method.

**Research Questions**

1. Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the language experience approach in a resource room?

2. Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the Mastery Learning reading method in a resource room?

3. What are the major differences in the student learning process as described in frequency of student verbal operants, and percent student responding in verbal operant categories, between the language experience approach and the Mastery Learning reading method in a resource room?

4. How does the use of the cloze procedure, as an element of the language experience approach, affect student responding in terms of frequency of verbal operants and percent story read non-echoically?

**Definitions**

**Audience**

An audience is an individual or group in the presence of
which a verbal response by a person is reinforced. As such, the audience becomes a discriminative stimulus for the production of verbal responses.

**Autoclitic**

An autoclitic is a tact whose discriminative stimulus is a currently strong operant in the primary Verbal Behavior, and whose verbal response is discriminative (varies) with respect to that operant's controlling variable, strength or verbal response form.

**Behavior**

"The behavior of an organism is that portion of the organism's interaction with the environment that is characterized by detectable displacement in space through time of some part of the organism and that results in a measurable change in at least one aspect of the environment" (Johnston & Pennypacker, 1980, p. 48).

**Cloze Procedure**

Omitting words in a predetermined manner from a text and requiring a student to use contextual clues to supply the missing words or synonyms for them. Every n\text{th} word, or every verb, or adjective could be erased.
Consequence
A stimulus (verbal or non-verbal) which temporally follows a response and, as a result, changes the probability of the future occurrence of that response.

Contingencies of Reinforcement
The relationships between antecedent, response, and consequence are called the contingencies of reinforcement.

Discriminative Stimulus
An antecedent stimulus in the presence of which a specific response class will be reinforced and hence has a high probability of occurring in the presence of the antecedent stimulus.

Echoic
An echoic is a verbal operant whose controlling variable is one's own or another person's verbal behavior, and whose verbal responses reproduce the stimulus.

Establishing Operation
An establishing operation "is any change in the environment which alters the effectiveness of some object or event as reinforcement and simultaneously alters the momentary frequency of the behavior that has been followed by that reinforcement" (Michael, 1982, p. 150-151).
Functional Relationship

Demonstrating a behavior change in response to systematic variations in at least one of its controlling conditions (Sidman, 1960, p. 64).

Intraverbal

An intraverbal is a verbal operant whose controlling variable is prior verbal behavior. Intraverbals may be clusters or chains.

Language Experience

The following method of teaching Basic Sight Vocabulary words:

1. A stimulus (word, picture, question) is provided for a child with the objective that the child tell a story from his/her experience. This story is written down verbatim by the teacher.

2. The teacher reads the story with the child several times pointing to the words. The child is encouraged to 'read' any parts he/she can remember.

3. In subsequent lessons the child can read more and more as he/she remembers more with repetition.

4. The teacher rewrites the story and cuts the rewrite into sentence strips. The child is given the task of putting the sentences in order.
5. Finally, the sentence strips are cut into individual words and are presented in the final lesson to the child as flashcards. Those words correctly identified by the child are retained in a file and a new stimulus for a new story is presented in the next lesson.

**Mands**

A mand is defined as a verbal operant whose controlling variable is an establishing operation or establishing stimulus or aversive stimulus, and whose verbal response specifies its reinforcer.

**Mastery Learning**

A systematically designed program using scripted lessons, rapid pacing, and specific signaling and correction procedures to teach specific skills in reading, math, and spelling.

**Non-Vocal Verbal Behavior**

Bodily or facial gestures which are reinforced through the mediation of another person.

**Probes**

A supplementary stimulus used by an organism who does not know what the response will be.
Prompts
A supplementary stimulus given by an organism who knows what the desired response is to be.

Response
The single instance of any class of behavioral events (Johnston & Pennypacker, 1980, p. 96).

Tact
A tact is a verbal operant whose antecedent is an environmental event or discriminative stimulus and whose reinforcement has been (is) contingent upon a conventional correspondence between the discriminative stimulus and the verbal response. Tacts are under stimulus control.

Textual
A textual is a verbal operant whose controlling variable is writing, printing, picture, etc., and whose verbal response is functionally equivalent to the proper name of the stimulus.

Verbal Behavior
Behavior reinforced through the mediation of other persons (Skinner, 1957, p. 14).
Verbal Operant
A class of unique responses which are functionally equivalent.

Vocal Verbal Behavior
Verbal behavior which is audible to the human ear.
Chapter II

REVIEW OF LITERATURE

The three sections in this chapter are designed to interpret for the reader the small and slowly growing research area stimulated by Skinner's *Verbal Behavior* (1957). First, the analysis of verbal behavior proposed by Skinner is placed within the larger framework of an operant account of human behavior. The major components (i.e., verbal operants) of the behavioral explanation for language are then defined. The purpose of this section is to make clear to the reader the functional nature of these definitions.

The third section describes the literature informed by *Verbal Behavior*. There has been little systematic research in the area of verbal behavior. Included in this section are studies which cited *Verbal Behavior*, and which used at least one of the verbal operants described in this book to explain or describe human verbal behavior.

*Verbal Behavior and an Operant Account of Human Behavior*

The philosophy of behaviorism states that human behavior is determined, lawful, continuous, and occurs at the level of the individual. The behavioral unit of analysis is the operant which is a functionally or topographically defined class of responses. A specific individual act is a subset of an operant and is called a response. Operant behavior is
explained in terms of contingencies of reinforcement. More specifically the probability of the occurrence of a response is accounted for when the relationships among an antecedent condition, the response, and the consequence are described. The history of the individual is taken into account in this three-term contingency in that a stimulus will function discriminatively if the individual has a history of that response class being followed by reinforcement only in its presence. Motivational states of deprivation, satiation, and aversive stimulation also change the probability of the occurrence of behavior. Behaviorism is deductive. It arose originally "out of observations made on single organisms responding in a carefully controlled and highly standardized artificial experimental situation" (Millenson & Leslie, 1979, p. 16). Animal research is the base upon which both the principles and technology of human behavior modification was built.

The empirical basis of the experimental analysis of behavior has been gradually, but steadily, broadened. Starting from the lever-pressing of rats for food, many other responses, reinforcers and species have been examined; and it has been possible to thereby show that principles derived from the original situation can be generalized to many other superficially dissimilar situations and to man himself. (Millenson & Leslie, 1979, p.18)
Verbal behavior is regarded as a subset of operant behavior. This subset is defined with the stipulation that consequences of verbal behavior are mediated by another organism (Skinner, 1969). If verbal behavior (i.e., communication through any medium) is seen as a subset of operant behavior, it is not sufficient or necessary to invent hypothetical conditions to explain any particular utterance or gesture. The environment is examined for the contingencies of reinforcement. Just as the operant is the unit of analysis for nonverbal human behavior, verbal behavior uses classes of responses called verbal operants as the units of analysis. Verbal operants are defined functionally rather than formally. Once these classes can be described in terms of the variables of which they are a function, "we can account for the dynamic characteristics of verbal behavior within a framework appropriate to human behavior as a whole" (Skinner, 1957, p. 10). The role played by the contingencies of reinforcement in verbal behavior is best illustrated through more detailed examination of the verbal operants and the audience variable.

Definitions of Verbal Operants

The mand

A mand is a verbal operant whose controlling variable is a state of deprivation or an aversive stimulus and whose verbal response specifies its reinforcer. An example would be the following: Person B is standing blocking the
sidewalk. Person A wishes to pass and says, "Step aside." Person B steps aside. Person A emitted a mand which specified its reinforcer - step aside. The state of aversive stimulation was not being able to pass. Mands can occur in softened form also as in, "Please step aside.", or "I'd appreciate it if you would kindly move out of my way." An instructional mand could be, "Write these words in your notebook." The speaker 'wants' something, hence is 'interested'. The audience or listener usually feels a state of aversive stimulation when asked a question until the question is answered or the request is followed. The speaker is conditioned also to comply partly because the same courtesy may be extended to him/her when the roles are reversed.

**The tact**

The tact is a verbal operant whose antecedent is an environmental event or state of affairs (S) and whose reinforcer has been contingent upon a conventional correspondence between the environmental S and the verbal response. Typically, a tact can be thought of as naming. It can involve naming an object, a person, or an abstract quality. An example of a tact is the following: A parent points to a bus in the street and says to a child, "What is that?" The child responds, "Bus." The child has named the object. The response "bus" is a tact. The verbal community accepts inexact tacting during the formation of a verbal
repertoire but gradually requires more and more of an exact 'conventional' correspondence between stimulus and verbal response. By preparing exact tactors, the mediator can vastly extend the range of his own senses (i.e., he can have an environment he has never seen described to him). Whereas the mand is an imposition, the tact is more like a favor. Much instructional time is spent teaching exact tacting.

The echoic

An echoic is a verbal operant whose controlling variable is one's own or another speaker's verbal behavior and whose verbal response reproduces the stimulus. A typical example is the following: A parent says to a child, "Say 'dog'," the child says "dog", the parent reinforces the child. Again, it is the audience who benefits mostly from successfully teaching echoic behavior. Echoic behavior allows the rapid teaching of new vocabulary and language through imitation.

The textual

A textual is a verbal operant whose controlling variable is writing, printing, pictures, etc., and whose verbal response is functionally equivalent to the proper name of the stimulus. For example, a teacher presents the word "black" printed on a flashcard to a student and says, "Read this word, please." If the student responds, "Black," this response would be a textual. Whereas in echoic behavior
there is a point-to-point correspondence in the same medium between the stimulus and the response, in textual behavior there is a functional, not a point-to-point correspondence as the stimulus and the response occur in different media: writing-reading, spoken-written. Textual behavior is taught in schools to introduce and maintain children as members of our literate society.

The intraverbal

An intraverbal is any verbal response whose controlling variable is the speaker's own or any prior verbal response. An example of an intraverbal chain would be completing the expression: "Red, white and ---" with the word "blue". Cliches fit the description of intraverbal behavior and much of one's language is generated and maintained by one's own (immediately) prior verbalizations. Intraverbal behavior can interfere with textual behavior sometimes when an individual 'reads' a word he/she 'thinks' should follow other words, rather than the actual word on the page.

The autoclitic

An autoclitic is a tact whose discriminative stimulus is a currently strong operant in the primary verbal behavior, and whose verbal response is discriminative (i.e., varies) with respect to that operant's controlling variable, strength, or verbal response form. Primary verbal behavior refers to the presence of $S_\text{av}$, aversive stimulation, or deprivation which increase the probability of the verbal
response of some operant. The speaker has 'something to say'. An example of an autoclitic indicating "strength" of a verbal response form would be: "The dictionary gives this meaning for the word....". The use of the phrase "The dictionary gives" lends additional strength to the explanation of the word. This indication of strength would be much weaker if the initial phrase was: "I suppose that the meaning....". The audience gains additional information regarding the variable(s) controlling the speaker's response. Autoclitic operants organize and arrange the primary verbal behavior in terms usually denoted 'grammatical'. An example of the ordering function of autoclitic operants would be the typical location of adjectives before nouns in the English language such as: a brown cow, a red bicycle.

The audience variable

The audience or hearer or listener can serve as a discriminative stimulus for the speaker's verbal behavior. The speaker may speak or not speak depending on the presence or absence of an audience. However, the audience provides more than a stimulus situation for the speaker. Audiences differ in the behaviors they reinforce. A speaker has many repertoires of behaviors which are selected and emitted under the control of the audience variable. A person uses two distinct repertoires of behavior, verbal and otherwise, in response to the presence of two different reinforcing audiences. A person can be his/her own audience and can, as
such, talk to him/herself. In this way one can engage in covert or overt verbal behavior with oneself as audience.

Whereas operant theory is derived from research, verbal behavior, as an extension of that theory, is as yet not empirically based. It is the function of this review to present the research findings which have been reported in the literature.

Verbal Behavior and Research

*Verbal Behavior* (1957) has influenced the field of behavioral research in several ways. This diverse research is conceptualized as attempts to address questions in four major areas: 1) direct testing of hypotheses from *Verbal Behavior*, 2) behavioral interpretations of maladaptive verbal behavior, 3) use of verbal operants and analysis to describe and increase verbalizations of subjects to improve their social competence, and 4) the application of functional definitions of verbal behavior to the design of instruction. *Hypothesis Testing* is used to label those studies whose primary focus is the investigation of some relationship posited in *Verbal Behavior*. The three major hypotheses tested concerned the effects of contingencies of reinforcement and stimulus control on the nature and frequency of verbalizations, and the functional independence of listening and speaking repertoires in the individual organism.

*Interpretive applications to Maladaptive Behavior* is the
section in which discussion-type articles are described which explain and interpret delusional and hallucinatory verbalizations using the verbal operant framework. **Socially Significant** describes those studies whose major focus is description or intervention on socially important verbal behaviors of special populations, particularly those studies concerned with teaching new verbalizations and increasing and maintaining existing verbal repertoires. The section on **Instruction** contains literature in which the activities of students during instruction are analyzed using verbal operants. From these analyses, instructional methodologies are proposed which relate the assignment given to student verbal behaviors.

**Hypothesis testing from Verbal Behavior**

These investigations focused on three areas: 1) the role played by stimulus control in the production of verbalizations, 2) the influence of contingencies of reinforcement on the frequency of occurrence of verbal behavior, and 3) the independence of listening and speaking repertoires.

**Stimulus Control.** Tacting, echoic, and textual behavior all occur in the presence of discriminative stimuli and are under stimulus control (*Verbal Behavior*, 1957, pp. 55, 65, 90). The stimulus control of tacting was examined by Lahren (1978) in a study in which college students were asked to describe aloud the events occurring in short films. Their descriptive behavior was regarded as tacting. Their
verbal behavior was then correlated with stimuli occurring on film. Lahren ably demonstrated the control exerted by certain stimuli on the subjects' verbal behavior by showing corresponding changes in verbal behavior when film segments were sequenced differently.

Stimulus control in echoic behavior was the subject of Boe and Winokur's experiment (1978) in which the authors tested whether echoic behavior occurred in adult interaction when it was not reinforced. Synonyms were substituted in questions asked at different times and the target words were shown to be clearly related to the occurrence of those words as echoics in the subjects' verbal behavior.

A more complex illustration of stimulus control is discussed by Skinner in what he calls "partially conditioned autoclitic 'frames'" (p. 336). In autoclitic operants which are grammatical in nature, an example of such a frame is the possessive phrase "the boy's--". Skinner proposed that a frame conditioned for a response such as "the boy's bicycle" may be available for combination with other responses, hence making novel utterances likely such as "the boy's coat". Whitehurst (1972) taught labels and colors using nonsense words to young children (22 and 24 months old) using a modeling procedure. The echoic responses of the subjects were treated as novel utterances when the subjects correctly labeled an object using color and label in that order on the first presentation. Color nonsense words always preceded
labeling nonsense words creating a partially conditioned autoclitic frame. The stimulus control for responding (i.e., the relational order of the two words) was then tested through removal of the constant response member (the color word) and substitution by a new color word. Ensuing responses were not grammatically correct (i.e., the stimulus control of the autoclitic frame was disrupted).

The notion of stimulus control in verbal behavior is supported by this limited number of studies. The tightly controlled conditions of these studies illustrates the complexities of isolating controlling stimuli since much of verbal behavior is under the control of multiple stimuli, discriminative and motivational.

**Contingencies of Reinforcement.** The major events controlling the acquisition and maintenance of verbal behavior are the contingencies of reinforcement (Skinner, pp. 29-30). A person is more likely to respond verbally in the presence of a reinforcing audience (p. 172). The explicit purpose of McLeish and Martin's study (1975) was to "provide a test of B. F. Skinner's hypotheses about verbal behavior and reinforcement principles" (p. 3). Several university student discussion groups were audiotaped and the verbal behavior of the participants coded using verbal operant categories. Increases and decreases in individual verbal behavior within the groups were analyzed and found to be related directly to reinforcement delivered by other group members. McLeish and
Martin concluded that the operant categories as applied by them were sufficient to describe the verbal behavior of their subjects. Furthermore, positively reinforcing consequences seemed to play a greater role than negatively reinforcing consequences in shaping the social verbal interactions of the group members. Finally, the authors claimed that through their analysis of verbal behavior as a function of the contingencies of reinforcement the individual nature of verbal behavior was highlighted. While the verbal behavior of all group members could be shown to be related to contingencies of reinforcement, the specific contingencies operating to control verbalizations were quite different across individuals.

**Listening and Speaking Repertoires.** The most systematic inquiry has been made on the independence of listening and speaking repertoires in the individual. Skinner states

The processes through which a man becomes a listener differ... from those through which he becomes a speaker. In acquiring a verbal repertoire the speaker does not necessarily become a listener, and in acquiring the behavior characteristic of a listener he does not spontaneously become a speaker. (p. 195)

These assertions were investigated by Lee (1981), Lee and Pegler (1982), and Lamarre and Holland (1985). In Lee (1981), subjects who were taught a response in a verbal
repertoire generalized that response to the nonverbal repertoire but the opposite did not happen (i.e., reinforcement of a response in the nonverbal repertoire did not result in collateral changes in the verbal repertoire). For example, when the experimenter placed a cup behind a book and asked the subject where the cup was, the subject was conditioned to respond, "Behind the book." The subject could then place the cup behind the book when told to do so (nonverbal response). The opposite did not happen. When the subject was conditioned to place a cup behind a book on verbal instruction, the subject could not then tell the experimenter where the cup was when asked. Lee explained the carryover effect of the first finding by stating that once a verbal response was conditioned and the subjects had the topography of the nonverbal response in their repertoire, then the generalization was the result of a change in the stimulus control of pre-existing topographies rather than transfer of responding across repertoires. New topographies were not instated. Lee concluded by asserting the functional independence of listening and speaking repertoires.

The generality of Lee's (1981) results was further strengthened by Lee and Pegler (1982). They showed there was little transfer of learning from reading to spelling. Subjects were trained to read words aloud and were then tested for the written spelling of those words. Overtraining in reading was also conducted (training after the
subjects had mastered the words) and weak increments in spelling were noted. The improvements in spelling which did occur were attributed to chained practice rather than transfer across repertoires. The components of the over-training procedure identified to be responsible for spelling improvement were initial training in reading and repeated opportunities to look at but not say words. Lee admits this interpretation is speculative, not conclusive.

The final investigative study presented here is Lemarre and Holland's (1985) experiment using mands and tacts with the same response form. Subjects were taught to mand and tact such expressions as "on the right" and "on the left". Subjects were presented with two objects and were trained to follow verbal instructions to place one object to the right or left of the second. Then they would tell the experimenter to place an object to the right or left of the second object and were reinforced when they identified whether the experimenter was correct or not. When the criteria for a correct mand were reversed, testing of the tacting repertoire showed no reversal. Hence, as in Lee (1981) and Lee and Pegler (1982), the acquisition of direction following repertoires and direction giving repertoires was found to be independent.

The studies described above were concerned with empirical investigation of three main areas related to verbal behavior: 1) stimulus control of verbal operants, 2) the role played by contingencies of reinforcement in relation to the frequency
of emission of verbal behavior and the occurrence of specific operants, and 3) the independent functions within the single organism of the repertoires of listener and speaker. The main findings support the hypothesis selected in each case. The next section will examine how the interpretation of maladaptive verbal behavior has been influenced by Verbal Behavior.

**Interpretive Applications to Maladaptive Verbal Behavior**

Support for the usefulness of a theory can be derived from applications of that theory which help explain probable causes of behavior. Three such applications of the theory of verbal behavior to interpret the maladaptive verbal behavior of patients who are mentally ill appear in the literature (Glenn, 1983; Burns, Heiby, & Tharp, 1983; Layng & Andronis, 1984).

Glenn used verbal operants to interpret the verbal behavior of clients who sought help from psychologists or psychiatrists. Poor observation, lying, and denial were seen as inadequate tactual. A person may be an inadequate tacter because he/she has not been taught to tact (hence is unable), or because the inadequate tactual results in reinforcement whereas accurate tactual may be punished (as in lying). Audience control is seen to play a large part in the descriptions of lying and denial. The presence of a potentially punishing audience can result in either behavior. Accordingly, the therapist's role may be to teach
accurate tacting or may extend no further than realizing the client wants a reinforcing audience, and not learn to behave differently. The typical practice of not reacting adversely to reports of undesirable client behavior is seen as consistent with the behavioral viewpoint of not being a punishing audience.

Manipulative and demanding behavior was seen as maladaptive manding. Here the short term reinforcing consequences of manipulative behavior outweigh the long term aversive consequences of having no friends or reinforcing audience. Interpersonal relations depend on reciprocity between speaker and listener. This implicit assurance of similar treatment when the roles reverse is one of the major reasons why people satisfy mands of others. With demanding and manipulative behavior, no such assurance exists. The manding works in one direction only and quickly becomes extremely aversive to the listener. The therapist's role may be to provide unemotional responding.

Obsessing was interpreted as runaway intraverbals. Runaway intraverbal behavior is seen to be an indication that the client does not discriminate between solvable and insoluble problems. When the obsessing behavior consists of negative self-tacting (I'm no good), it may be necessary for the therapist to teach the client to tact the positive reinforcers which are contingent on their behavior. Glenn's main contention was if the discriminative and reinforcing
stimuli controlling such behaviors could be identified, these could then be altered to change patient behavior to conform more closely with social norms.

More serious maladaptive behavior was assessed from a behavioral perspective by Burns, Heiby and Tharp (1983). Here, auditory hallucinations were suggested to occur in response to mishearing ambiguous stimuli. As the patient 'echoes' these misheard stimuli, the verbal behavior chain resulting may be maintained through intraverbal control. This intraverbal behavior is typically unedited and is compared to automatic writing in which the writer is not aware of what is being written. The unedited nature of the intraverbal behavior may further disrupt appropriate stimulus control. It was further proposed that with time, such hallucinatory behavior may be parasitic on normal verbal behavior, may interfere with it, and may even prevent it. The effects on the environment of such behavior is not addressed here but is the focal point of the interpretation proposed by Layng and Audronis (1984) of hallucinations and delusional speech.

Layng and Andronis (1984) asked the questions: How is this (maladaptive) behavior reinforced and maintained, and then, how could such reinforcement be made accessible to the patients through more socially acceptable verbal behavior? Therefore, the premise that human verbal behavior is subject to control by the contingencies of reinforcement
like nonverbal behavior, was used by Layng and Andronis to account for the presence of maladaptive verbal behavior. One example detailed the behavior of a woman in a psychiatric ward whose claim that her head was falling off resulted in much staff attention. If attention was regarded as reinforcing, the author asked why the patient didn't request this attention in the normal manner at the nurses' station. Investigation showed that when the normal procedure was followed, the patient sometimes interrupted staff conversations and staff hostile responses were aversive. When staff attention was contingent upon appropriate client interaction, the delusion disappeared.

Although the articles concerned with maladaptive verbal behavior are not data-based, they provide a useful perspective for the possible application of such interpretations to treatment of pathological verbalizations. As such, they encourage empirical investigation of the usefulness of thinking about such behavior in terms of verbal operants and maintaining contingencies. Studies which applied behavioral concepts of verbal behavior towards improving socially relevant behaviors are reviewed below.

**Verbal Behavior and Socially Significant Behaviors**

Socially significant behaviors are conceptualized as nonacademic verbal interpersonal interactions in both academic and nonacademic settings. The literature on socially significant behaviors and verbal behavior is here
categorized into descriptive and experimental.

**Descriptive Studies.** The major questions addressed by these studies related to the differences which exist in the interactions observed between adults and children with retardation, and between adults and so-called 'normal' children; and, secondly, whether changes in verbalizations occurred in a developmental manner. Of the descriptive studies, three cited *Verbal Behavior* but used definitions or concepts from the book only as a small part of their descriptions.

Huret and Bar (1971) described the communication pattern between retarded children and their mothers, and between the same children and speech therapists. Adult verbalizations contained more suggestions, questions, and commands and children gave more information. The major stimuli controlling the responses of parents were found to be environmental (i.e., associated with the physical aspects of the environment), and therapists responded more to preceding children's verbalizations.

Veit, Allen, and Chinsky (1976) described the interaction pattern between institutionalized children with retardation and their attendants using an observational method that contained a code for the mand/tact operants. Attendants used mands four times more frequently than tacts and tacts occurred three times more frequently than mands in the verbalizations of the children. This distribution was inferred
to reflect the supervisory and directive aspects of the aides' roles. The objective of the study was to test the reliability of the observational instrument.

Marshall and Hegrenes (1973) assessed the frequency and order of occurrence of verbal operants in the speech of mothers and their children with retardation compared with that of mothers and children who were not retarded. Verbal behavior of both children and mothers was analyzed. Mands, tacts, and intraverbals were found to occur with greater frequency among the children without retardation while children with retardation emitted more echoics. The mothers differed with regard to frequency of manding only, with mothers of children with retardation manding with a much higher frequency. However, it should be noted that the variable of parent education and social class was not controlled.

The findings reported by Marshall and Hegrenes were challenged in an attempted replication by Gutman and Rondal (1979). Here children were matched according to their language level rather than chronological age as in the Marshall and Hegrenes study. Hence, subjects with retardation were typically older than the other subjects. The order of usage of verbal operants was similar to that found in the earlier study. Mothers in all cases used more mands, and children in all cases used more tacts than any other verbal operant. Gutman and Rondal found, contrary to Marshall and
Hegrenes that mothers of children with retardation used fewer mands than mothers of children without retardation, though not statistically significantly fewer. Also, mothers of children with retardation used significantly more intra-verbal operants. These differences in results were explained by Gutman and Rondal as the possible effects of using a different categorical system than that used by Marshall and Hegrenes. More operants were identified in the later study and the definitions of operants contained many subclasses in some cases (e.g., echoics were termed 'simple echoics', 'modified echoics', 'self-echoics', and 'modified self-echoics'). The echoic was one class of verbal operant in the earlier study. This illustrates the different ways the definitions of verbal operants have been applied in different studies which make comparison difficult.

The final study focusing on describing the occurrence of a verbal operant is an examination of the mand interactions among adolescents with and without retardation in vocational settings (Holvoet, Keilitz, & Tucker, 1975). Four groups of adolescents were the subjects in the study. The first group consisted of adolescents without handicaps who worked in vocational settings in the community. The other three groups were adolescents with mild and severe mental retardation, one group living in the community and working there, the second group living in an institution and working in the community, and the last group living and working in an
institution. The dependent variable was manding by the immediate supervisors to the subjects in all settings. Manding was divided into three classes: 1) Explicit mands - instructions, orders or commands such as "Get in the truck"; 2) Mand prompts - verbal statements or gestures not in mand form but serving functionally as mands such as "There's a box of nails in the corner" implying the subject should go there for nails; and 3) Mand questions - mands which specified a verbal response by the subjects. For all groups explicit mands were used more frequently than the other types. The group living and working in an institution received a greater number of explicit mands than the other three groups. The authors compared this finding to that of Marshall and Hegrenes where mothers of children with retardation emitted more mands than mothers of children without handicaps. Positive consequences for compliance with mands were not observable in any setting in the form of social praise. It was suggested that such praise may be seen as "extraneous to the formal contingencies governing work performance" (p. 243). These contingencies are fixed interval payment of wages.

Poon and Butler (1972) described developmental changes in children's usage of vocal-verbal and nonvocal-verbal (gesture) responses to a modified version of the Intraverbal Gesture subtest of the Parson's Language Sample. The subjects in the study were not handicapped, and were divided
into three groups by age, five-year-olds, six-year-olds, and seven-year-olds. The subjects were required to make intra-verbal responses to a "show me or tell me" or "tell me or show me" direction. Responses were categorized as vocal-verbal, gestural or bimodal (vocal-verbal and gestural). Vocal-verbal responses were produced more frequently than any other type by all groups. Gestural responses occurred more frequently with decreasing age. Bimodal responses were most frequently made by the oldest group. The authors suggested a developmental sequence of intraverbal behavior may be indicated by the data, the sequence increasing in complexity from gestures to verbalizations to bimodal responses.

Most data for studies in this section were analyzed statistically yielding mean rates of occurrence of verbal operants and degrees of statistical significance. One of Skinner's major premises in his interpretation of verbal behavior is the individual nature of such behavior. The term 'verbal behavior' "emphasized the individual speaker and, whether recognized by the user or not, specifies behavior shaped and maintained by mediated consequences" (Verbal Behavior, 1957, p. 2). Further, Skinner asserts "one important feature of the analysis (described in Verbal Behavior) is that it is directed to the behavior of the individual speaker and listener" (p. 11, parentheses added). Condensing individual data to group means, when the data consist of verbal operants, makes it impossible to identify and
eventually control the variables of which verbal behavior is a function.

While acknowledging the problem of using statistical analyses for such data three major outcomes emerge: 1) Adults interact verbally with children with mental retardation differently than with nonhandicapped children, though the specific nature of the differences is not clear; 2) Adults in authority over children (regardless of whether the children are handicapped or not) use more mands than any other verbal operant; and 3) Children with retardation use more tacts than any other operant in their interactions with adults in authority.

Experimental studies. The following literature contains experimental efforts to change important social behaviors, particularly to occasion or increase vocalizations among handicapped children. Matheny (1968) explored the problem of echolalic behavior, first isolating controlling stimuli for echoic responses, and then testing the use of other teacher-provided stimuli to decrease echoic responding. Teacher verbal behavior was categorized as mand or tact and subject verbal behavior was classed as echoic or nonechoic. A relationship was shown to exist between teacher tacting and subject echoic verbalizations, and teacher manding and student nonechoic responses. Matheny explained this pattern using the behavioral interpretation of the acquisition and maintenance of echoic behavior as follows. Echoic responses
by children are typically reinforced by parents when the parent is teaching new behavior. Gradually, the child's echoic responses become reinforced discriminatively for occurring in nonechoic situations and extinguished for being echoic only. Then Matheny asserted echoic behavior is shaped for the teaching of new or uncomprehended vocalizations. It is likely the child will echo in the presence of later uncomprehended vocalizations. This might be true particularly when the uncomprehended vocalization is longer than a one-word tact (for example, "That's a nice house you are building"). It is implied that it is more difficult for the child to know how to respond to such a tact than it is to respond to mands such as: "Wash your hands", or "Say 'dog'". In this way, Matheny assumed that tacts are "relatively less comprehensible than mands", are more abstract, and therefore more likely to occasion the emission of echoic behavior. The author implied that using more mand statements may help reduce echolalic responding, particularly if the teacher/parent obeyed the mand when it was echoed by the child. By this process the child may be taught to mand and hence achieve some control over the environment (in this case, the behavior of others) through verbal behavior.

Peine, Gregersen, and Sloane (1970) increased the rate of spontaneous verbalization (mainly the use of mands and tacts) of a nine-year-old girl with a language delay. The program was instituted in the child's classroom by her
teachers. The child was taught to tact using a modeling procedure in a one-on-one tutorial setting outside the classroom. Teachers then used social reinforcers contingent only on verbalizations by the child in the classroom. These verbalizations were prompted at first by teacher prompts such as: "I want (candy, lunch, water)". Echoic responses by the student produced reinforcement at first. Later, the student was expected to produce the sentence as a mand. Verbal prompts were removed and spontaneous manding was then reinforced. Vocabulary building sessions were successful in teaching new tacting responses and marked increases in the child's spontaneous verbal responses (particularly mands) were noted in the classroom.

The verbal behavior of an electively mute student with retardation was reinstated in an experiment by Ayllon and Kelly (1974). The dependent variable was student verbal responses to teacher mands such as "Say my name". By defining teacher questions as mands, acceptable responses satisfied those mands, as a mand specifies its own reinforcement. Social and primary reinforcement were used to shape and maintain verbal responses. Shaping in this study described the process used to teach the behaviors accompanying the verbal response; eye contact, opening the mouth, and blowing through the lips. The experiment was initiated outside the classroom and eventually was instated in the regular class. Student verbal responses increased from zero to 100 percent
correct to 20-30 mands per 15 minute session.

Efforts to increase the frequency of verbalization of a four-year-old child are described by Reynolds and Risley (1968). Reinforcement was made contingent on speaking. The subject was required to mand to get the toy she wanted and was then reinforced by teacher social attention and receipt of the toy. When receipt of the toy was made contingent on further verbalization in response to teacher questions, the subject's verbalizations increased although the actual increase consisted of a repetition of the original mand. Reynolds and Risley discovered that after a careful analysis of the conditions of the experiment verbalization increased as the child's mands were successful. When teacher social praise was the reward for speaking and the child's mand was not successful, the frequency of manding decreased rapidly. Furthermore, the increase in manding did not transfer to any other verbal operant or to any other exemplar.

The relationship between emitting successful mands and increased manding was also demonstrated by O'Brien, Azrin, and Henson (1969). The objective of this experiment was to increase communications in the form of suggestions for improved conditions by chronically ill mental patients. With the variable of experimenter controlled (two persons interacted with the patients), it was clearly shown that patients' suggestions increased directly in proportion to the number of mands which were successful.
The experimental studies described in this section thus far have concentrated on changing verbal behavior through emphasis on reinforcement for correct responding. In contrast to these, Mithaug and Wolfe (1976) focused on the first element of the three-term contingency, antecedent conditions, to increase vocalizations (mainly mands) among students with language delays by concentrating on setting and task arrangements. The tasks were set up in such a way that for one student to be successful some manding was required which resulted in a second, third, or fourth student providing help. Seating arrangements alone (i.e., placing students in close proximity with one another) were not sufficient to increase verbal behavior when the task set was independent. Independent tasks consisted of puzzle pieces and a backing board on which the pieces had to be assembled. Each child had his own backing board and all his puzzle pieces and could complete the task without help from a partner. Interdependent tasks used the same materials but in this condition the subject and his partner had their own backing boards and had each other's puzzle pieces. The subject had to request puzzle pieces from his partner. Verbal behavior increased dramatically with interdependence of task.

The remaining three studies concerned with socially important verbal behavior concentrated on increasing verbalization through teaching specific verbal operants and facilitating maintenance and generalization of these operants.
Rogers-Warren and Warren (1980) described the "mand-model technique" of facilitating classroom use of language taught in one-on-one training sessions. The subjects were children with severe language delays. With the mand-model technique, teachers manded a verbal response from the subjects, reinforced an appropriate response, and modeled a correct verbalization if none or an inappropriate one was given. In this way the teachers controlled the rate of emission of verbalizations from the subject and reinforced each mand by complying with it. The authors asserted that successful manding "provided opportunities for...(subjects) to observe language working to control the environment" (p. 379).

Hung (1980) investigated the training and generalization of two mands (yes and no) emitted by two children with autism, one echolalic and one non-vocal. For the non-vocal subject the training procedures were much longer as the responses had to be taught as echoics first. When the responses 'yes' and 'no' were in both subjects' repertoires, food items were presented and the subjects were required to mand 'yes' to receive the food or 'no' to have the food withdrawn. Food items were selected after pretesting to assess which were liked and disliked reliably by the subjects. Testing for generalization consisted in presenting new food items (items not used in training but tested for liking). Correct responses were reinforced as before but incorrect responding to a 'no' item resulted in delivery of
this food, and incorrect responding to a 'yes' item resulted in withdrawal of that item. Results indicated generalization of manding occurred for the subject with echolalia after training on only one set of items. The nonvocal subject needed to be trained on five sets of items before generalization occurred.

Spontaneous manding (i.e., manding in the presence of a visual, not vocal cue) was the objective of Simic and Bucher's (1980) experiment in which six children with language delays were taught to mand using "I want" and "out". The authors wanted to teach the mands and also teach the subjects to discriminate when each mand would be likely to be reinforced. The 'I want' mand was reinforced when a tray of edibles was presented to the subjects and the subjects manded verbally and touched the food container of choice on the tray. The 'out' mand was reinforced when the tray of edibles was visible on the other side of a half door or glass window and the subjects manded verbally and moved to within touching distance of the window or door. Approximations to the actual cues were not successful in teaching the mands. These approximations were a scaled down model of a half door placed between subjects and experimenter on a table, and a tray containing edibles in bags presented across the table by the experimenter. The subjects transferred manding across exemplars and settings (i.e., from trainer to staff person, and from training room to playroom). Discriminating
when to use which mand was successful for some subjects and not for others. Two of the subjects failed to discriminate the cues for the emission of each operant and emitted the same response in the presence of both cues. The other subjects were successful in discriminating when to use which operant.

In the area of socially significant behaviors, Verbal Behavior has stimulated valuable research. This research has focused on reducing ineffective verbal behavior such as excessive echoic verbalizations as in echolalia, and increasing appropriate verbal interactions. The population targeted in these studies was primarily children with language delays, though an adult population with low verbal output was represented (O'Brien et al., 1969). It is important to note that the mand was the verbal operant most frequently taught and reinforced by the researchers. Manding is the most obvious verbal means of exerting some control over the environment. The reinforcement of mands is directly dependent on the mediation of others. The populations described above are most often placed in schools and institutions in which control of the environment is most directly in the hands of those in authority (e.g., attendants or teachers). The major findings indicate verbal behavior can be taught successfully in many cases thereby increasing personal control over the environment. These results can be summarized as follows:
1. There may be a relationship between tacting and manding of teachers and excessive echoing by children, more manding resulting in reduced echolalic responding. This conclusion is tentative as it is based on one study only.

2. Mands can be taught successfully to children with severe language deficits. The responses may need to be shaped as echoics initially.

3. Manding is most efficiently increased and maintained when the mands are successful (i.e., the mander receives the reinforcement specified by the mand).

4. Manding verbal responses is successful in increasing verbal behavior when the behavior manded is in the subjects' repertoire.

5. Setting and task features can be controlled and organized to increase manding responses.

Verbal Behavior and Instruction

The brief literature concerned with instruction and Verbal Behavior falls into two subclasses. First, studies will be described which investigated a teaching method for successful acquisition of specific types of verbal behavior defined as echoic and textual. Second, those studies which analyzed instruction and learning using verbal operants and used the analysis to help in the design of future instruction will be presented.
Teaching Methods. Lane and Schneider (1963) compared six methods used to self-shape echoic behavior. Self-shaped behavior was defined as "the occasions of reinforcement for successive approximations...exclusively under the control of the subject himself" (p. 154). The subject's objective was to add a minimal echoic operant in a foreign language to his repertoire. Tape recordings of the verbal stimulus to be echoed were used. Matching drills with discrimination training and varied types of feedback were presented. In discrimination training several different stimuli were presented, the first one being the target stimulus. The subject accumulated points when stimuli similar to the first one were correctly identified. Feedback was delayed auditory, or visual. In the delayed auditory condition, the subject heard his own response played back after a brief delay. The use of an analogue display to give visual feedback to the subject was most successful in teaching the echoic. Pitch and duration of the sound were illustrated on an oscilloscope and the subject received immediate visual feedback when he echoed the stimulus. The screen displayed a horizontal line of specified length when the subject's response was a faithful echo of the stimulus. If the pitch was incorrect, the line moved vertically. If the duration was longer or shorter, the line drawn in response to the subject's response would be correspondingly longer or shorter than the specified correct length, thus providing
the subject with visual feedback. Whether this finding was subject specific or has wider generality is not discussed in the study.

McDowell (1968) developed an instructional sequence requiring systematic teaching of verbal operants to teach textual behavior. Kindergarten children were taught to read 14 words from the story Goldilocks and the Three Bears. A tape recording of the story was used simultaneously with a series of line drawings. The target words were taught in context by requiring the subjects to echo the portions of the text in which the words occurred while looking at the relevant pictures. Five nouns, five adjectives, and four verbs were selected. These words were then written at the bottom of the pictures illustrating them and the tape of the story was stopped before the occurrence of each word. Subjects were required to supply the word. In this way, intraverbal responding was taught. To transfer control from pictorial to written stimuli, the pictures were faded using sheets of tracing paper until finally only the recording and the written stimuli remained. The subjects successfully learned to respond to the target words textually. It seemed they did not need the echoic portion of the sequence as familiarity with the story resulted in an intraverbal repertoire rapidly developing.

Only two experimental studies were found which focused on instruction for the acquisition of specific verbal
operants, the echoic (Lane & Schneider, 1963), and textual behavior (McDowell, 1968). The major conclusions were:

1. Visual feedback is more effective than auditory feedback when acquiring an echoic operant in a foreign language. It must be stressed that as only one subject was tested in this study, and without a body of experimental knowledge in this area, the generality of these data has not been established.

2. Intraverbal behavior seems to play a dominant role in the acquisition of textual behavior. This has relevance for the present study as the stimulus for teaching textual behavior in the language experience approach is from the subject's own intraverbal behavior.

Instructional Design. The literature in this section relates to a behavioral conceptualization of the process of instruction. The skills being instructed are analyzed using the three-term contingency (i.e., antecedent condition, response, and consequence). Instruction is then designed to create conditions in which the skills to be taught will occur and be reinforced.

Vargas (1978) analyzed composition skills. She interpreted direction writing as manding, and descriptive composition as tacting. When writing directions is assumed to be manding, the manding is successful if the reader (i.e., the audience) can follow the directions. Therefore, it is crucial that the writer observe the effects of the manding
on an audience following the directions. In this way "An effective mand enables the reader to be successful at performing the task the writer specifies" (p. 17). Vargas suggested that students need experience in writing directions. Further, she suggested that the effectiveness of the writing be evaluated by how well an audience can perform the task as described.

When descriptive composition is assumed to be tacting, the writer must reproduce in writing the many details of an experience which made it unique so the audience can share the experience. A suggested exercise is to have an audience draw a picture of something described in writing by the writer.

Vargas identified variables that interfere with tact control. These factors are imitative behavior (i.e., copying what someone else has written), and intraverbal control (producing cliches or jargon). Vargas stressed the importance of the role played by the audience in writing. It is not seen as the function of the audience to edit written composition, but to react to its content. It is the role of the instructor to provide exercises for students to enable them to focus on the content when that is the target.

The verbal tasks required of an advanced learner (college level) were the subject of a theoretical paper by Johnson and Chase (1981). A typology of these tasks was constructed using verbal operants. The verbal tasks
selected were based on those exhibited by 'experts' in any particular field. Expert status was defined by the nature of the verbal tasks which would be in an expert's repertoire, and the proficiency with which the expert could execute those tasks. Examples of the tasks and their verbal operant categories would be:

(i) provide definitions -- Intraverbal behavior
(ii) define technical properties of an object -- Tacting
(iii) pronounce written terms correctly -- Textual behavior

Verbal tasks were conceptualized on two levels, elementary and conceptual. Elementary verbal tasks require fixed verbal behavior such as reading and reciting. Conceptual tasks require flexible, extended verbal behavior such as combinations of the tasks exemplified above. The extended nature of conceptual verbal tasks was defined by the relation between instruction and later verbal behavior. Greater extension is portrayed when the learner's verbal behavior after instruction is less like that taught during instruction. Stimulus generalization would be an example of extension from the original instruction. Experts would be expected to be proficient at the conceptual level.

Johnson and Chased admitted the difficulty of identifying the controlling relations in any verbal task because of multiple causation. A major factor to be considered here is the history of the individual. An individual's previous
experience with a topic may generate more intraverbal control over verbal behavior which looks like tacting. The authors suggested that many varied tasks be presented to students to ensure mastery of specific verbal relations. The usefulness of the typology has not been validated empirically. Initial questions suggested by the authors concerned "the clarity, generality, and utility of the typology for people involved in instruction" (p. 117).

The intraverbal operant was divided into three subclasses in the typology presented above. An empirical test of the validity of this division was the subject of a dissertation reported by Chase, Johnson, and Sulzer-Azaroff (1985). The three subclasses in the earlier (1981) article were: 1) defining/describing, 2) example identification, and 3) example request. In the first subclass (defining/describing), an example would be defining reinforcement. A student would be asked to select from written scenarios the one which is an example of reinforcement in the second subclass (example identification). Giving an independent example of reinforcement (one not provided in instruction) would be a task required in the third subclass (example request). To assess the validity of the division, Chase et al. designed an experiment in which three groups of college students were provided with instruction (concept training) each using one of the above subclasses of the intraverbal. All subjects were tested for their rates of concept
acquisition using all three subclasses (e.g., subjects trained using definitions and descriptions only were tested using items requiring example identification, example request, definitions, and descriptions). Subjects responded correctly to example identification tasks more quickly and accurately than to the other two tasks. Subjects responded differentially to tasks involving novel question types (questions not used in training though regarded as intraverbal). Those trained using exemplification (subclass three) performed better in the novel tasks than did those trained in the other conditions. The authors concluded there was an empirical basis for the subdivision of the intraverbal operant into three distinct classes.

The final paper in this section suggests how behavior analysis can assist the development of instructional programs using interactive computer systems (Chase, 1985). Chase addressed the two major criticisms of behaviorally designed programs of instruction: 1) these programs do not make use of technological innovations such as interactive video systems, and 2) the goals of these programs have primarily been lower level skill teaching. The purpose of the article was to provide prompts on three levels to those designing instruction who wish to avail of technological innovations. The three levels reflect the areas of expertise required to provide effective instruction using computer technology. These areas are: 1) instructional design
1) content, and 3) computer technology. Accordingly, Chase provided prompts in all three areas.

Chase suggested the typology of verbal tasks described earlier in this review might provide a useful framework from which to develop the kinds of questions desirable in instructional design. The advantages of using this typology would be:

1. The tasks described in it are based on the verbal behaviors of experts.
2. The verbal tasks are sequentially organized from elementary to conceptual.
3. The typology is based on observable relations between instructor and student.

A topic analysis is suggested to organize the content. This analysis (supported by research by Engleman and Carnine) is a process of subdividing a topic into subtopics, and identifying related topics. The characteristics of all subtopics are then defined using concrete operational language.

With regard to using computers, Chase provided a list of questions to ask when evaluating authoring systems which allow the development of courseware. Authoring systems usually 1) provide a prompting feature (i.e., it asks how the instructional designer wishes to organize the content), 2) require coding of information into a language understood by the computer, 3) present the required information to the student as curriculum, and 4) may collect data on the
students' progress through the program. The major flaw in authoring systems was identified to be a failure of the prompting program to provide opportunities for effective behaviorally based instructional design. The computer may not ask the right questions or enough questions. Chase suggested such systems can be improved by the provision of prompts outside of the authoring system. For behavior analysis to remain at the forefront of instructional design, Chase believes it must move into the area of interactive computer instructional media.

Summary

The first section of this review produced three major conclusions: 1) certain verbal operants can be shown to be a function of stimulus control; 2) the frequency of verbal behavior in some settings can be related to the amount and frequency of reinforcement received; and 3) the repertoire of an organism as listener is independent from the repertoire of the same organism as speaker. This study examines the tasks set for the student in an already existing reading instructional process and the objective of the Language Experience Approach is to bridge two repertoires, the verbal and textual. The research has shown that this does not occur without training.

The second section of the chapter highlights the value of interpreting verbal behavior from the verbal operant perspective. Although the articles examined here are not
data-based, they provide some plausible and possibly testable explanations for verbal behavior typically assigned such labels as 'insane', 'inexplicable', 'irrational' or 'nonsensical'. The language experience approach to teaching textual behavior has not been described or explained behaviorally and it seems clear that when the causes for behavior are assumed to exist in the environment rather than in the mind (as in psycholinguistic explanations), the process can be better understood and improved.

The third section of the review described several examples of the usefulness of the behavioral interpretation of language in increasing verbal behavior in children with language delays. When language was shown to have a function (as in successful manding), children's verbal behavior increased. The language experience method attempts to show the student the relationship between speaking and writing, and then that between writing and student textual behavior.

*Verbal Behavior* 's influence on instruction was reported in the final section. Verbal operants were shown to be useful in designing instruction and in analyzing the requirements set for the student when reading, writing, or concept learning. Existing successful instructional processes were not examined behaviorally to analyze their components. Intraverbal behavior was shown to be a powerful influence on the acquisition of textual behavior by young children. The language experience approach attempts to use intraverbal
behavior to teach textual behavior and it is the purpose of this study to describe how student behavior changes from intraverbal control to textual control. The specific procedures adopted to examine the research questions are described in the following chapter.
Chapter III

METHODS AND PROCEDURES

This chapter describes the methods and procedures for the study. Participants and setting are presented, dependent variables are defined, and units of measurement are explained. Finally, the procedures for baseline in both reading methods and the intervention procedures in the language experience method are delineated.

Participants

In this school system, an evaluation team conducts an assessment for students with academic, social, or emotional problems in the regular classroom. This team is composed of the principal, school psychologist, speech therapist, regular classroom teacher, and the special education teacher. Academic assessments frequently show that reading method(s) used in the regular classroom (i.e., whole word look-and-say method, or phonic method, or a combination of both) are not successful for the referred student(s). A holistic method for reading instruction is usually recommended if the student is placed in a resource room. Holistic reading instruction includes speaking, writing, reading, and drawing or art work rather than phonics or a look-and-say method. Holistic reading instruction is applied with a variation of the language experience approach, as this method uses the student's own
spoken language, requires the student (in some instances) to copy parts of the story told by the student and initially written by the teacher, and reading with the teacher.

At any one time the teacher is likely to be using the language experience approach to reading instruction with one to four students. During the course of data collection for this study, three students were being instructed using this approach. Accordingly, the participants in this study were the three students being instructed using the language experience approach at that time. One student was female and two were male. Participant A had been instructed using the language experience approach during the Fall semester prior to data collection. Participants B and C began reading instruction with the language experience approach during the course of the study. Participant A was a sixth grade student who attended a resource room 18.5 hours per week. Subjects B and C were first grade students who attended the resource room 12.5 hours per week. Table 1 gives a summary of participants' characteristics.
Table 1

Sex, Age, Grade, and Number of Hours Spent in the Learning Disability Resource Room.

<table>
<thead>
<tr>
<th>Student</th>
<th>Sex</th>
<th>Age</th>
<th>Grade</th>
<th>Number of Hours Spent Weekly in Resource Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F</td>
<td>12</td>
<td>6</td>
<td>18.5</td>
</tr>
<tr>
<td>B</td>
<td>M</td>
<td>7</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>C</td>
<td>M</td>
<td>7</td>
<td>1</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Setting

The setting was a resource room for students with learning disabilities at the elementary level in an urban school. Students from first to sixth grades received instruction in the resource room for part or all of the day as stated in their IEPs. The seven-meter by seven-meter room contained learning centers around the perimeter and a teacher's table and an aide's table. The study was conducted at the teacher's table in the south-east corner of the room. The teacher was the instructor.

Teacher

The teacher has a Master of Arts Degree in Education and teacher certification in Educable Mentally Retarded, Learning and Behavior Disorders, and Reading. She has six years
teaching experience in the Resource Room for the Learning Disabled. The teacher conducted the procedures in the study. She taught each lesson in the language experience approach and in the Mastery Learning method. The experimenter was not present when the teacher taught these lessons. The teacher implemented the intervention procedure in the language experience approach with Participant A.

**Definition of the Dependent Variables**

Two dependent variables were selected for study. One was the rate of the student's verbal operants, particularly echoics, textuals, intraverbals, and textual-intraverbals. These operants were identified from transcripts of the instructional process. The second dependent variable was the percentage of each story read non-echoically. Each lesson was audiotaped with a Panasonic mini-recorder. The tape recorder was placed on the table between the teacher and the participant(s). The teacher turned on the recorder when she began the lesson and turned off the recorder at the end of the lesson. The experimenter collected the recorded cassette tape each day and provided a new audiotape. A transcript of each tape was typed using an Apple IIE computer and a word processing program. The computer sheets of the transcripts were not separated to retain the continuous nature of the lesson and to facilitate identification of verbal episodes and verbal operants within episodes.

The transcripts were segmented into verbal episodes. A
verbal episode was identified using both the transcript and the tape recording. The beginning and ending of an episode was any teacher response which broke the continuity of the student's response. For example:

Teacher: O.K., I need you to read it back to me quickly and then you'll be finished. Maurice

Student: Maurice has a cold. One day Maurice said

Teacher: the moose

This was one verbal episode. The next episode had as its beginning the teacher's response "the moose". For a second example:

Teacher: because

Student: because I'll have confidence

Teacher: Good job!

Student: in myself

Teacher: Great!

This was one verbal episode if the tape recording showed that the student maintained his/her vocal response across the teacher's interjection of the first praise statement.

Within each verbal episode, student echoics, textuals, intraverbals, and textual-intraverbals were identified. Table 2 presents examples of how these verbal operants were identified from the transcripts. For identifying echoic operants, the antecedent condition was always a teacher verbalization. The response by the student was always vocal verbal. Repeated utterances within the student's own
For identifying textual operants, the antecedent condition was the presentation of a text, either one word or more than one word. With a one-word presentation by the teacher, a student response which was the proper name of the written stimulus was a textual. Table 2 describes the second antecedent condition for identifying textual operants as the presentation of a text with more than one word. The student's attempts to sound out the initial sound of a word in the text was a textual.

In identifying intraverbal operants, two antecedent conditions were possible. The first antecedent is a teacher verbalization instructing the student to tell about some event or object. The student's response is an intraverbal operant. The second antecedent condition is the presentation by the teacher of a textual stimulus. Any substitution by the student for one or more of the words in the text is an intraverbal operant.

In identifying textual-intraverbal operants in the transcripts, echoics, textuals, and intraverbals are first delineated. Any remaining text of the student's response is a textual-intraverbal (see Table 2). See Appendix A for examples of transcripts with verbal episodes identified and verbal operants delineated.

The second dependent variable, percentage of the story read non-echoically, was defined as that percentage of the
<table>
<thead>
<tr>
<th>Verbal Operant</th>
<th>Antecedent</th>
<th>Response (Operant Underlined)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Echoic</strong></td>
<td>Teacher verbalization:</td>
<td>&quot;The dog's name... &quot;</td>
</tr>
<tr>
<td></td>
<td>&quot;What is the dog's name?&quot;</td>
<td></td>
</tr>
<tr>
<td><strong>Textual</strong></td>
<td>Text: Dog.</td>
<td>&quot;Dog.&quot;</td>
</tr>
<tr>
<td>1.</td>
<td>Text: The cat is black.</td>
<td>&quot;The cat is b-b-l- &quot;</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intraverbal</strong></td>
<td>Teacher verbalization:</td>
<td>&quot;My dog is small.&quot;</td>
</tr>
<tr>
<td>1.</td>
<td>&quot;Tell me about your dog.&quot;</td>
<td>&quot;The boys are looking at me.&quot;</td>
</tr>
<tr>
<td>2.</td>
<td>Text: The boys are</td>
<td></td>
</tr>
<tr>
<td></td>
<td>watching me.</td>
<td></td>
</tr>
<tr>
<td><strong>Textual-Intraverbal</strong></td>
<td>Text: She chased a kitty</td>
<td>&quot;She ran ... chased a k -k -kitty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cat down the street.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cat down the street.</td>
</tr>
</tbody>
</table>
story read by a participant correctly (i.e., without substitutions), and without teacher prompts.

Measurement of the Dependent Variables

The total duration of the story reading session of each lesson was measured from the first vocal utterance to the last using the recordings. The first vocal utterance was the reading of the first word of the story, whether the teacher or participant read it. The last utterance was the last word in the story read by the participant. The frequency for each category of the dependent variable was recorded. A hand-held digital stop watch was used to measure time. The first and last utterances for each reading were highlighted on the transcripts to aid timing. Listening to the tapes, the experimenter used the transcripts to indicate when to begin and cease timing.

The number of verbal operants was recorded from the lesson transcripts. Rate per minute of the textual-intraverbal and intraverbal operants was calculated by dividing the total for each of these verbal operants by the duration of the lesson in minutes.

Each story was written on a separate sheet of paper and the total number of words was counted. The transcripts from each story reading session were then examined and words read incorrectly or echoed were counted. The remaining words were expressed as a percentage of the total number of words in the relevant story. This percentage was calculated by dividing
the number of words read without teacher prompts by the total number of words in the story times one hundred. This percentage was the percentage read non-echoically. These measures were completed for each lesson and presented in story blocks (i.e., in three to six lesson units).

For research questions two and three, a measure common to both the language experience approach and the Mastery Learning method was necessary. Percentage of student total responses per verbal operant was used as that measure. For one complete lesson in the Mastery Learning method, the total number of verbal operants in the students' responses was calculated. This total was regarded as 100 percent of student responses. The number of each verbal operant emitted by the students was expressed as a percentage of the total number of verbal operants. This percentage was calculated by dividing the number of each specific operant by the total number of verbal operants times one hundred.

In the language experience approach, for each story told by each participant, total student responding was calculated across the three to six reading sessions. For example, story one was read by Participant A for five sessions. The total number of verbal operants was calculated for all five sessions cumulatively. Then the total for individual verbal operants was expressed as a percentage of the participant's total responses. This percentage was calculated by dividing the number for each particular verbal operant by the total
number of verbal operants emitted during all readings times one hundred.

When presented diagramatically (using pie-charts), it was then possible to make comparisons between the two reading methods for the responses required of the students.

Reliability and Accuracy of Measurement

Four accuracy measures and one interobserver agreement measure were provided. The accuracy measures were conducted on the correspondence between transcripts and tapes, counts of verbal operants from the transcripts, timing of lessons, and percentage of stories read non-echoically. Interobserver agreement measures were taken on the identification of verbal operants in the transcripts.

The accuracy of the transcripts was assessed by presenting an independent observer with the tape recording and the transcript for one randomly chosen lesson per story per participant for the language experience approach. All random selections for agreement and accuracy measures were determined using a table of random numbers (Hopkins & Glass, 1978). The instructions given for using the table were followed by the experimenter. To determine the entry point into the table, the experimenter placed the point of a pencil on the table without looking. The two digits nearest the tip of the pencil were used to determine the row and column to be used to begin selecting the random numbers. Numbers were selected by moving along the selected row from left to right.
The following directions were given to the independent observer: "Run the tape as often as necessary and compare it to the written transcript. Note any differences between them on the transcript, additions, omissions, and inaccuracies."

Two Mastery Learning programs were selected for description. As each lesson in these programs (Decoding A and Decoding B) had exactly the same construction, two lessons in each program were recorded. Accuracy measures on the transcripts of these lessons were made by presenting an independent observer with the tape and transcript of one randomly chosen lesson from each program. The directions were the same as those given for the transcripts of the language experience approach described above.

The accuracy of the total timing of each lesson was addressed by presenting an independent observer with a stopwatch, the tape, and the transcript for one randomly chosen lesson per story per participant. The following directions were given: "Time the lesson from the first utterance to the last as indicated on the transcript. Include in this time any silence between responses." The Mastery Learning lessons were checked for accuracy of timing in the same manner.

The accuracy of the frequency count for individual operants was evaluated by giving an independent observer a transcript of one randomly chosen Mastery Learning lesson,
and one randomly chosen language experience story reading lesson from each subject. The verbal operants were highlighted on the transcripts. The following direction was given: "Count the number of times each operant occurs."

**Independent Observer**

One doctoral candidate participated as observer. This candidate had successfully completed courses in Applied Behavior Analysis and Single Subject Research Methods.

**Training**

Definitions and examples of the verbal operants were given to the observer and controlling variables were described. For example, the echoic controlling variable was the teacher's immediately prior verbal behavior. The textuals referred to the written text the student read. The student's phonic attempt at reading was defined as a textual operant if coincident with the initial sound of the written word. The written text was also used to define intraverbal operants. Deviations from the text (e.g., substitutions) were defined as intraverbal operants.

The observer demonstrated mastery (i.e., 100 percent correct) of identifications and definitions for verbal operants during oral tests. Eight questions were presented in each instance (identification and definition) and feedback was given on the completion of each section.

Following mastery of the oral tests, the independent observer was asked to identify verbal operants within
designated verbal episodes on the transcripts. The observer was instructed to first identify echoics, pure textuals, and pure intraverbals, then assign the category of textual-intraverbal to the remaining student verbalizations. Feedback was given to the observer after the completion of each verbal episode. The observer and the experimenter independently assigned verbal operant categories to student verbalizations in verbal episodes until 100 percent agreement was reached in nine out of ten consecutive verbal episodes. A decision log was given to the observer to provide further examples and guidelines to aid in decision making. Appendices B, C, and D contain copies of the training manual, decision log, and test questions, respectively.

**Procedure**

The independent observer was given a transcript of one randomly chosen language experience lesson, and one Mastery Learning lesson from each program (Decoding A and Decoding B). Five verbal episodes were selected randomly from these transcripts and delineated with the symbols []. The following instructions were given: "Within these five verbal episodes, identify the verbal operants in the student's responses. Use the decision log to help you decide how to label the utterances. Use the tape recording of the episodes if necessary. Highlight echoics in blue, and intraverbals in pink."
Verification of the Independent Variables

Intervention and baseline conditions for the language experience approach were identifiable on the tape recordings. The independent observer was presented with a random sample of three lessons from the baseline condition and three lessons from the intervention condition in transcript and tape modes. The observer was asked to attend to the instructions given to the student in each lesson and note any major differences between lessons. The observer was not aware of which lessons came from baseline or intervention conditions.

Materials

A Panasonic RQ-383 mini-tape recorder and 60 or 90 minute TDK cassette tapes were used to record the classroom lessons. An Advance digital stopwatch was used to time the lessons. The Mastery Learning programs used were Word-Attack Basics, Corrective Reading, Decoding A (1978), and Decoding Strategies, Corrective Reading, Decoding B (1978). The teacher used the teacher's manual for each program.

During the intervention condition of the language experience approach, the experimenter used a sheet of lined paper provided by the teacher to rewrite the participant's stories.
Procedures

This section describes the procedures for a) the collection of descriptive data for the language experience and Mastery Learning approaches, and b) the baseline and intervention conditions during the language experience approach.

The Language Experience Approach – Descriptive

Each language experience unit lasted from three to six story reading sessions depending upon whether the student learned the story.

Session One. The teacher and student talked about some event or object. The student dictated about this event or object and the teacher transcribed exactly what the student said onto a lined sheet of paper. The teacher then orally read the transcribed story before the student read. This was the most frequent response prompt. The teacher also provided cues by asking questions about events in the story.

Session Two. The teacher instructed the student by providing the same response prompt and cues as in the first session. At the end of this session, the student was asked to draw a picture illustrating some aspect of the story.

Session Three. The teacher rewrote the story on cardboard strips one meter long and nine centimeters wide. Each strip contained one sentence from the story and often the beginning or ending of another sentence. One of two
procedures was then followed.

1. The student was asked to put these sentence strips in order using the original story as a guide. Then the student read the story using the matched sentence strips. The student worked alone without teacher prompts or directions.

2. The student read the first sentence from the original story, then found the equivalent sentence among the strips. As the strip sentence usually contained the beginning of the next sentence, the student read this and was asked to identify what would follow. If the student could remember the next word, that was the word looked for in the strips. If this word could not be recalled, the student was referred back to the original copy of the story.

As the student reread the story using the sentence strips, the teacher underlined all known words on the original copy. Any out-of-order sentence strip was discussed by the teacher when the student reached it (if the student had followed procedure one above). In this discussion, the teacher referred the student to the last correctly placed sentence strip and instructed the student to locate that sentence in the original copy of the story. Then the student read the ensuing sentence and searched for the corresponding sentence among the sentence strips. The correct
sentence strip was then found and placed in its place.

The procedures for the fourth, fifth, and sixth sessions were the same as for the third session. Additionally, during the last session, words which had been underlined during previous lessons were presented on flashcards. Those words which the students identified correctly on three consecutive presentations were recorded.

**Mastery Learning Method - Descriptive**

The Mastery Learning lessons were fully scripted in the teacher's manuals (referenced in the Materials section of this chapter) and the teacher followed the specified procedures. Lessons 54 and 55 of Decoding A were taped, and lessons 89 and 90 of Decoding B were taped. Words, letters, and letter combinations were written on the chalkboard during the lessons when necessary. These lessons were taught to groups of students, usually three to four at a time. Each student used the relevant workbook pages for the lessons. When students made errors in their responses, the teacher corrected the error and required the students to repeat the correct response once or twice. All student responding followed a quick downward movement of the teacher's right hand. When students in the group did not respond together, the teacher reiterated the question and required a choral answer.
The Language Experience Approach - Baseline

One student was selected by the teacher to participate in the experimental aspect of this study. The procedures for the descriptive data on the language experience approach described above were exactly those followed in the baseline condition with one exception. At all times the student completed the sentence strip matching without teacher prompts or directions.

Language Experience Approach - Intervention

The use of the cloze procedure (i.e., omitting words from the text, either specific words such as verbs, or adjectives, or words in a pattern such as every fifth word) in place of the sentence strip matching activity was the intervention chosen. The cloze procedure may increase the use of contextual clues to aid word recognition (Lopardo, 1975). Comprehension has also been tested through the use of the cloze procedure (Balyeat & Normal, 1975).

The procedure for the first lessons was the same as the baseline condition. For the second lesson, the story was rewritten on a second sheet of paper with every fifth word omitted. In instances where omitting the next fifth word resulted in the same word being chosen many times, the next available word was omitted. The first letter of the missing word was included in the text. Where the initial sound of a word was formed by a letter combination such as ch- or sh-, the entire combination was included. The stories with
words omitted are included in Appendix E.

The teacher presented the new text and instructed the student to read it and indicated there were words missing. The student was told that the first letter(s) of the missing words was included to help them decide what the words might be. When the student could not decide what a given missing word was, the teacher instructed her to use the word "blank" in place of the original and see if that helped her identify a suitable word. It was not necessary for the student to guess the exact word in each case. A substitute, beginning with the same letter, which would make sense in the sentence was acceptable. The first sound was given to help the student focus on phonic as well as textual cues.

The procedures for lessons on the third, fourth, or fifth days resemble those for the second day exactly. After the final reading of the story, the words in it were presented in flashcard form. Those words read correctly on three consecutive presentations were tallied.

Social Validity

Wolf (1978) suggested that any study in applied behavior analysis should demonstrate the social validity of its goals, its procedures, and its results. The case for the social validity of the goals of this study was built during the literature review section in which it was shown that information regarding the language experience approach to reading has not been generated through use of verbal
operants identified in student responses. The usefulness of this information to the practitioner is discussed in chapter five of this study. The teacher was used to provide evidence of the social validity of the procedures and results. An interview was held with the teacher at the conclusion of the study to discuss her professional opinions of the procedures and results derived from the research. A transcript of this interview is presented in Appendix F.

Maintenance

As a maintenance measure, for at least four weeks after the conclusion of the study it was ascertained by interview if the teacher was still using the intervention method and if this method had been used with another student in the classroom.

Experimental Design

The experimental data of this study is displayed and analyzed using a reversal design (Baer, Wolf, & Risley, 1968). As the approach currently being used by the teacher was regarded as a successful one and the purpose of the experiment was to evaluate the effectiveness of the intervention compared to the usual procedure, reverting to the original method was not an ethical concern. The logic of the reversal design was discussed by Baer et al. (1968):
Here a behavior is measured, and the measure is examined over time until its stability is clear. Then the experimental variable is applied. The behavior continues to be measured to see if the variable will produce a behavioral change. If it does, the experimental variable is discontinued or altered to see if the behavior change depends on it. If so, the behavior change should be lost or diminished (thus the term 'reversal'). The experimental variable is then applied again to see if the behavioral change can be recovered...The experimenter is attempting to show an analysis of the behavior at hand: that whenever he applies a certain variable, the behavior is produced, and whenever he removes this variable, the behavior is lost. (p. 94)

The reversal design in this study had four conditions:
1. Baseline: sentence strip matching
2. Intervention: cloze procedure
3. Baseline B: sentence strip matching
4. Intervention B: cloze procedure
Chapter IV

RESULTS

Four research questions were asked to assess the usefulness of using verbal operants from Skinner's *Verbal Behavior* to describe student responding during the language experience approach and the Mastery Learning methods. In the first section accuracy measures and interobserver agreement scores are reported. Then quantitative data are presented regarding each research question.

Accuracy Measures

**Timing**

Twenty stories were told by the three participants, nine by Participant A, six by Participant B, and five by Participant C (see Appendix G). Each story was read by its author between three to six times. The total number of story readings was 82. On two occasions mechanical failure resulted in incomplete data or no data being recorded. Therefore, 80 story readings were collected in audiotape form and transcribed (see Appendix H for sample transcriptions for each Participant). Of the 80 transcripts, 20 were randomly chosen for independent time check. Twenty accuracy checks were made on the duration of story reading sessions. The criterion for agreement was plus or minus one second. In every instance, criterion was reached.
Accuracy of the Transcripts

Of the 80 transcripts and tapes, 20 were randomly selected for an independent check on the relationship between the accuracy of the transcripts. One hundred percent accuracy criterion was reached on all occasions.

Accuracy of Verbal Operant Count

Twenty transcripts were randomly chosen from the 80 collected for an independent check on the verbal operant count. One hundred percent accuracy criterion was reached on all transcripts.

Interobserver Agreement on Verbal Operants in Transcripts

Interobserver agreement was computed on a total of 100 verbal episodes, five from each transcript. Interobserver agreement scores were computed for each of the verbal operants echoic, textual, textual-intraverbal, and intraverbal for each participant. Table 3 shows that the overall agreement score for all verbal operants was 92 percent for Participant A, 98 percent for Participant B, and 95 percent for Participant C. For Participant A, the agreement score was 100 percent for echoics, 99 percent for textual-intraverbals, 75 percent for textuals, and 80 percent for intraverbals. For Participant B, the agreement score was 100 percent for echoics, 100 percent for textual-intraverbals, 100 percent for textuals, and 86 percent for intraverbals. For Participant C, the agreement score was 100 percent for echoics, 94 percent for textual-intraverbals, 100 percent for textuals, and 80 percent for intraverbals.
Table 3

Interobserver Agreement Scores

<table>
<thead>
<tr>
<th>Participant</th>
<th>Per Verbal Operant</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td>92%</td>
</tr>
<tr>
<td>Echoics</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>99%</td>
<td></td>
</tr>
<tr>
<td>Textuals</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>Intraverbals</td>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>98%</td>
</tr>
<tr>
<td>Echoics</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Textuals</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Intraverbals</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>95%</td>
</tr>
<tr>
<td>Echoics</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>94%</td>
<td></td>
</tr>
<tr>
<td>Textuals</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Intraverbals</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>
Verification of Procedures

All transcripts and recordings from the experimental aspect of the study were reviewed by the independent observer. Teacher directions to the student were the focus of this evaluation. The independent observer divided the lessons into two types, those with sentence strip matching directions, and those with word omission (cloze procedure) directions. The two types of lessons corresponded exactly with baseline and intervention conditions. Procedures were carried out as planned across both conditions.

Research Question One

Can the verbal operants of Skinner's Verbal Behavior be used to describe a learning disabled student's reading behavior as a function of the language experience approach? Data for three participants are presented. The data include a percentage of the story read non-echoically during each session; rate of verbal operants per story per session; duration of story reading sessions; the relationship between duration and percentage of the story read non-echoically; and the relationships between the rate per minute of the verbal operants textual-intraverbal and intraverbal, and percentage of the story ready non-echoically. Tables 4, 5, and 6 present the percentages of the story read non-echoically for each participant. These percentages are illustrated in Figures 1, 2, 3, and 4.
Table 4

Percentage of the Story Read Non-Echoically for Participant A

<table>
<thead>
<tr>
<th>Stories</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>77</td>
<td>90</td>
<td>96</td>
<td>89</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>61</td>
<td>81</td>
<td>94</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5
Percentage of the Story Read Non-Echoically for Participant B

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Stories</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>12%</td>
<td>17%</td>
<td>22%</td>
<td>80%</td>
<td>37%</td>
<td>58%</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>3%</td>
<td>43%</td>
<td>44%</td>
<td>72%</td>
<td>70%</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>10%</td>
<td>66%</td>
<td>80%</td>
<td>89%</td>
<td>63%</td>
<td>72%</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>54%</td>
<td>77%</td>
<td>73%</td>
<td>94%</td>
<td></td>
<td>88%</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>71%</td>
<td>60%</td>
<td></td>
<td>89%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>87%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6

Percentage Story Read Non-Echoically Per Session for Participant C

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Stories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>63%</td>
</tr>
<tr>
<td>2</td>
<td>52%</td>
</tr>
<tr>
<td>3</td>
<td>79%</td>
</tr>
<tr>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>5</td>
<td>75%</td>
</tr>
<tr>
<td>6</td>
<td>87%</td>
</tr>
</tbody>
</table>
Figure 1. Participant A's percentage of the story read non-echoically per session.
Figure 2. Participant B's percentage of the story read non-echoically per session.
Figure 3. Participant C's percentage of the story read non-echoically per session.
Figure 4. Percentage of the story read non-echoically per session for three participants.
Percentage of the Story Read Non-Echoically: Participant A

Story One. During the readings of the first story, Participant A's percentage of the story read non-echoically ranged from 77 percent during the first reading to 96 percent during the third reading. Story strip matching (without teacher assistance) began between readings three and four. The mean and median percentage read non-echoically were 90 percent.

Story Two. Participant A's percentage read non-echoically ranged from 61 percent in the first reading, to 94 percent in the third reading. Story strip matching (without teacher assistance) began between the first and second readings. The mean percentage read non-echoically was 79 percent and the median was 81 percent.

Percentage of the Story Read Non-Echoically: Participant B

Story One. Participant B's percentage of the story read non-echoically ranged from three percent during the second reading, to 71 percent during the fifth reading. Sentence strip matching with teacher assistance was initiated between readings three and four. The mean percentage story read non-echoically was 30 percent and the median was 12 percent.

Story Two. Participant B's percentage of the story read non-echoically ranged from 17 percent during the first reading, to 87 percent during the sixth reading. Sentence strip matching was initiated with teacher assistance between readings three and four. The mean percentage story read
non-echoically was 58 percent and the median was 63 percent.

**Story Three.** Participant B's percentage of the story read non-echoically ranged from 22 percent during the first reading to 80 percent during reading three. Story strip matching with teacher assistance was initiated between readings one and two. The mean percent story read non-echoically was 55 percent and the median was 59 percent.

**Story Four.** Participant B's percentage of the story read non-echoically ranged from 72 percent during the second reading, to 94 percent during the fourth reading. Story strip matching with teacher assistance was initiated between readings two and three. The mean and median percentages read non-echoically were 85 percent.

**Story Five.** Participant B's percentage of the story read non-echoically ranged from 37 percent during the first reading, to 70 percent during the second reading. Sentence strip matching with teacher assistance was initiated between readings two and three. The mean percentage read non-echoically was 57 percent, and the median was 63 percent.

**Story Six.** Participant B's percentage of the story read non-echoically ranged from 58 percent during the first reading, to 88 percent during the fourth reading. Sentence strip matching with teacher assistance was initiated between readings two and three. The mean percentage of the story read non-echoically was 70 percent, and the median of 66 percent.
Percentage of the Story Read Non-Echoically: Participant C

**Story One.** Participant C's percentage of the story read non-echoically ranged from 52 percent during reading two, to 87 percent during reading six. Sentence strip matching without teacher assistance was initiated between readings two and three. The mean and median percentages story read non-echoically were 71 percent.

**Story Two.** Participant C's percentage of the story read non-echoically ranged from 12 percent during the first reading, to 89 percent during the fourth reading. Story strip matching with teacher assistance was initiated between readings one and two. The mean percentage of the story read non-echoically was 62 percent, and the median was 74 percent.

**Story Three.** Participant C's percentage of the story read non-echoically ranged from 59 percent during the first reading, to 84 percent during the third reading. Sentence strip matching with teacher assistance was initiated between readings one and two. The mean percentage of the story read non-echoically was 73 percent, and the median was 77 percent.

**Story Four.** Participant C's percentage of the story read non-echoically ranged from 36 percent in the first reading, to 70 percent in the second reading. Sentence strip matching with teacher assistance was initiated between readings two and three. The mean percentage of the story read non-echoically was 54 percent and the median was 55
percent.

**Story Five.** Participant C's percentage of the story read non-echoically ranged from 35 percent in the first reading, to 82 percent in the third reading. Sentence strip matching with teacher assistance was initiated between readings one and two. The mean percentage of the story read non-echoically was 64 percent, and the median was 74 percent.

For all three participants, a summary of ranges, means, and median percentages story read non-echoically is presented in Table 7. For Participant A, the ranges of percentage of the story read non-echoically were narrower and the means and medians higher than those for the other two participants. The ranges of percentages of the story read non-echoically for Participant B were wider than those for Participants A or C.

Tables 8, 9, and 10 display the raw data (as frequency scores) for the verbal operants echoic, textual-intraverbal, textual, and intraverbal for Participants A, B, and C, respectively. Tables 11, 12, and 13 present the duration of story reading sessions for each subject. From these data, rate per minute was calculated. As the frequency of textuals was very low, rate per minute was not calculated. The information yielded by frequency of echoics was presented in terms of percentage of the story read non-echoically earlier in this chapter. Accordingly, only rate per minute of
Table 7

Percentage Read Non-Echoically Per Story by Participant

<table>
<thead>
<tr>
<th>Participants</th>
<th>Percentages for Stories 1 through 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Participant A</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>77-96</td>
</tr>
<tr>
<td>Mean</td>
<td>90</td>
</tr>
<tr>
<td>Median</td>
<td>90</td>
</tr>
<tr>
<td>Participant B</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>3-71</td>
</tr>
<tr>
<td>Mean</td>
<td>30</td>
</tr>
<tr>
<td>Median</td>
<td>10</td>
</tr>
<tr>
<td>Participant C</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>52-87</td>
</tr>
<tr>
<td>Mean</td>
<td>71</td>
</tr>
<tr>
<td>Median</td>
<td>71</td>
</tr>
</tbody>
</table>
Table 8
Frequency of Verbal Operants Per Story for Participant A

<table>
<thead>
<tr>
<th>Stories</th>
<th>Frequency of Verbal Operants Per Story during each Session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td><strong>Story One</strong></td>
<td></td>
</tr>
<tr>
<td>Echoics</td>
<td>25</td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>22</td>
</tr>
<tr>
<td>Textuals</td>
<td>0</td>
</tr>
<tr>
<td>Intraverbals</td>
<td>1</td>
</tr>
</tbody>
</table>

**Story Two**

<p>| Echoics | 25  | 12  | 4   |
| Textual-Intraverbals | 18  | 15  | 5   |
| Textuals | 2   | 1   | 4   |
| Intraverbals | 0   | 3   | 6   |</p>
<table>
<thead>
<tr>
<th>Verbal Operants</th>
<th>Story 1</th>
<th>Story 2</th>
<th>Story 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echoics</td>
<td>28</td>
<td>38</td>
<td>16</td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>3</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Textuals</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Intraverbals</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>16</td>
<td>16</td>
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Table 10

Frequency of Verbal Operants Per Story for Participant C

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### Table 11

**Duration of Story Reading Sessions for Participant A**

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Duration of Story Reading Sessions for Participant B

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Number of Seconds to Read Story During Each Session
Table 13

Duration of Story Reading Sessions for Participant C

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textual-intraverbals and intraverbals is presented. Figures 5, 6, and 7 illustrate the data for all participants.

**Rate Per Minute of Verbal Operants Per Story: Participant A**

**Story One.** Participant A emitted between 2.7 and 10.8 textual-intraverbals per minute during story one with a mean of 5.3. The median rate per minute was 4.2. Zero point four nine intraverbals per minute were emitted during the first reading, and no intraverbals were emitted during any subsequent readings of this story.

**Story Two.** Participant A emitted between 2.6 and 10.8 textual-intraverbals per minute with a mean of 7.2. The median rate per minute was 8.2. No intraverbals were emitted during the first reading, and 3.1 per minute were emitted during the third reading.

**Rate Per Minute of Verbal Operants Per Story: Participant B**

**Story One.** Participant B emitted between 0.8 and 7.8 textual-intraverbals per minute with a mean and median of 3.6. Participant B emitted between 1.0 and 5.1 intraverbals with a mean of 2.2 and a median of 1.6.

**Story Two.** Participant B emitted between 1.8 and 5.6 textual-intraverbals per minute with a mean of 4.2 and a median of 5.0. Participant B emitted between 0.3 and 4.3 intraverbals per minute with a mean of 1.7 and a median of 1.2.

**Story Three.** Participant B emitted between 1.1 and 3.5 textual-intraverbals per minute with a mean of 2.1 and a median of 1.8. Participant B emitted between 0.3 and 2.0
Figure 5. Participant A's percentages of the story read non-echoically and rate of textual-intraverbal and intraverbal operants per session.
Figure 6. Participant B's percentage of the story read non-echoically and rate of textual-intra- and intraverbal operants per session.
Figure 7. Participant C's percentage of the story read non-echoically and rate of textual-intraverbal and intraverbal operants per session.
intraverbals per minute with a mean of 0.8 and a median of 0.5.

**Story Four.** Participant B emitted between 3.3 and 7.1 textual-intraverbals per minute with a mean of 5.1 and a median of 4.0. Participant B emitted between 1.0 and 1.7 intraverbals per minute with a mean of 1.2 and a median of 1.3.

**Story Five.** Participant B emitted between 3.9 and 7.0 textual-intraverbals per minute with a mean of 5.7 and a median of 6.1. Participant B emitted between 1.0 and 3.5 intraverbals per minute with a mean of 2.2 and a median of 2.0.

**Story Six.** Participant B emitted between 2.8 and 4.7 textual-intraverbals per minute with a mean and median of 3.8. Participant B emitted between 1.1 and 1.3 intraverbals per minute with a mean and median of 1.2.

**Rate Per Minute of Verbal Operants Per Story: Participant C**

**Story One.** Participant C emitted between 3.7 and 6.7 textual-intraverbals per minute with a mean of 5.1 and a median of 5.3. Participant C emitted between 1.9 and 3.7 intraverbals per minute with a mean of 2.8 and a median of 2.7.

**Story Two.** Participant C emitted between 1.3 and 4.6 textual-intraverbals per minute with a mean of 3.3 and a median of 3.7. Participant C emitted between 0.8 and 1.4 intraverbals per minute with a mean of 0.9 and a median of
1.1 No intraverbals were emitted during the first reading of this story.

**Story Three.** Participant C emitted between 2.7 and 5.6 textual-intraverbals per minute with a mean of 4.4 and a median of 5.0. Participant C emitted between 0.2 and 2.3 intraverbals per minute with a mean of 1.5 and a median of 2.1.

**Story Four.** Participant C emitted between 3.7 and 7.6 textual-intraverbals per minute with a mean of 5.7 and a median of 5.9. Participant C emitted between 1.1 and 2.5 intraverbals per minute with a mean of 1.6 and a median of 1.2.

**Story Five.** Participant C emitted between 1.3 and 8.8 textual-intraverbals per minute with a mean of 5.6 and a median of 6.7. Participant C emitted between 1.2 and 9.2 intraverbals per minute with a mean of 4.1 and a median of 1.8.

In summary, there were few differences in mean and median rates per minute for textual-intraverbals across the three participants. Participant A emitted fewer intraverbals than either Participants B or C. All three participants emitted fewer intraverbals than textual intraverbals.

The duration of each story reading session for Participants A, B, and C is presented in Tables 11, 12, and 13.
Duration of Story Reading Sessions: Participant A

The mean length of a story reading session during story one was 149 seconds, with a range of 120 to 168 seconds. For story two, the mean length of a story reading session was 109 seconds with a range of 100 to 117 seconds.

Duration of Story Reading Sessions: Participant B

For story one, the mean length of a story reading session was 290 seconds with a range of 175 to 626 seconds. For story two, the mean length of a story reading session was 211 seconds with a range of 143 to 440 seconds. For story three, the mean length of a story reading session was 473 seconds with a range of 130 to 635 seconds. For story four, the mean length of a story reading session was 143 seconds with a range of 117 to 180 seconds. For story five, the mean length of a story reading session was 200 seconds with a range of 137 to 286 seconds. For story six, the mean length of a story reading session was 265 seconds with a range of 105 to 416 seconds.

Duration of Story Reading Sessions: Participant C

The mean length of a story reading session during story one was 164 seconds with a range of 125 to 258 seconds. For story two, the mean length of a story reading session was 197 seconds with a range of 96 to 298 seconds. For story three, the mean length of a story reading session was 181 seconds with a range of 129 to 271 seconds. For story four, the mean length of a story reading session was 231
seconds with a range of 165 to 356 seconds. For story five, the mean length of a story reading session was 209 seconds with a range of 99 to 299 seconds.

In summary, the length of story reading sessions was shortest for Participant A and longest for Participant B. The greatest range of length of story reading sessions occurred with Participant B.

Three relationships are possible between time and percentage of the story read non-echoically. First, a direct relationship could be indicated by the data. In this instance, as the time increased in length, so would the percentage story read non-echoically. Second, an inverse relationship could be indicated by the data. In this instance, as the time increased or decreased in length, the percentage of the story read non-echoically would change in the opposite direction (e.g., with increasing time a decreasing percentage, or with decreasing time an increasing percentage). Third, no consistently direct or inverse relationship could be indicated by the data.

Relationship Between Time and Percentage of the Story Read Non-Echoically: Participant A

No consistent relationship was observed to occur between time and percentage of the story read non-echoically during story one (see Figure 8). For the first three data points (prior to sentence strip matching) a direct relationship was observed. Then for the last three data points,
Figure 8. Participant A's duration and percentage of the story read non-echoically per session.
an inverse relationship was indicated by the data where time increased, decreased, and then increased again, and percentage of the story read non-echoically first decreased and then increased. During story two, a direct relationship was observed to occur with increasing time accompanying increasing percentages read non-echoically.

**Relationship Between Time and Percentage of the Story Read Non-Echoically: Participant B**

A direct relationship was indicated by the data during story one (see Figure 9). The relationship was consistent except for the direction of change between the first and second data points which was decreasing for both time and percentage read non-echoically. The direct relationship observed during story two changed to an inverse one at the fourth data point (i.e., after sentence strip matching had been initiated). The data for story three show a direct relationship for the first two data points and an inverse relationship was observed for the last two data points. No consistent direct or inverse relationship was evident during story four. Beginning with an inverse relationship, the last two data points show a direct relationship with both time and percentage read non-echoically decreasing. A direct relationship is indicated by the data in story five with an increase in time correlating with an increase in percentage story read non-echoically at first. The last data point indicates a decrease in both measures. For story
Figure 9. Participant B's duration and percentage of the story read non-echoically per session.
six, a direct relationship is demonstrated for the first three sessions, and the beginning of an inverse relationship is indicated by the last data point.

**Relationship Between Time and Percentage of the Story Read Non-Echoically: Participant C**

For story one, the data indicate a direct relationship for the first four sessions though this relationship does not follow a consistent direction. The beginning of an inverse relationship was indicated by the last two data points. A direct relationship was also indicated by the data for story two. This relationship was not consistent with regard to the time measure as the third data point showed a decrease in time. All data points for percentage read non-echoically showed an increasing trend. The data for story three show no consistent direct or inverse relationships. An inverse relationship is evident across the first two data points and the beginning of a direct relationship is evident in the last data point. An inverse relationship is demonstrated by the data for story four.

Here, direction changed for both measures with the third data point (i.e., after the initiation of sentence strip matching). For story five, the direct relationship indicated in the first two data points ends with the beginning of an inverse relationship for the last data point.

In summary, the relationship pattern most frequently indicated by the data for all participants was a direct one
Figure 10. Participant C's duration and percentage of the story read non-echoically per session.
at first with the beginning of an inverse relationship evident in the final data points. The change from direct to inverse relationship most frequently accompanied the initiation of the sentence strip matching activity.

Percentage of the story read non-echoically is examined for its relationship to the rate of intraverbal and textual-intraverbal operants per minute. Figures 5, 6, and 7 present the data.

Relationship Between Intraverbals and Textual-Intraverbals and Percentage of the Story Read Non-Echoically:

Participant A

Story One. Participant A emitted pure intraverbals during the first reading only. Accordingly, no relationship is observable between the rates of textual-intraverbals and intraverbals. There is an inverse relationship between the rate of textual-intraverbals and percentage story read non-echoically. For the first three data points, as the percentage story read non-echoically increased the rate per minutes of textual-intraverbals decreased. Between data points three and four, percentage of the story read non-echoically decreased while rate of textual-intraverbals increased. For the last two data points, percentage of the story read non-echoically increased again while rate of textual-intraverbals decreased.

Story Two. Participant A emitted no intraverbals during the first reading. The rate of textual-intraverbals
decreased from the first data point to the third, thus indicating an inverse relationship with percentage of the story read non-echoically. For the last two data points the rate of intraverbals increased.

Relationship Between Intraverbals and Textual-Intraverbals and Percentage of the Story Read Non-Echoically: Participant B

**Story One.** The relationship shown by the data between the rate of textual-intraverbals and intraverbals is a direct one. This relationship is not perfect as the first data point for each verbal operant does not conform to this pattern. For the last four data points, the direct relationship is evident, being positive for three data points and ending with a decreasing trend. With the exception of the first data point, a direct relationship is indicated between the rate of the two verbal operants and percentage story read non-echoically. The beginning of an inverse relationship is suggested by the last data point.

**Story Two.** No clear relationship is evident between the rate of textual-intraverbals and intraverbals for the six data points in story two. A direct relationship is indicated between percentage of the story read non-echoically and the rate of textual-intraverbals. This relationship is not perfect as the fourth data point deviates from the pattern observed between the other points.

**Story Three.** A direct relationship between the rates of textual-intraverbals and intraverbals is indicated by the
data. The relationship most clearly suggested by the data between percentage of the story read non-echoically and the rates of the verbal operants is an inverse one. This relationship is not perfect as the values of the third data points are all higher than the second data points.

**Story Four.** There is no predominant relationship indicated by the data between the rate of textual-intraverbals and intraverbals. An inverse relationship is suggested by the first three data points and a direct relationship is suggested by the last three data points. A perfect inverse relationship is evident between the rate of textual-intraverbals and the percentage of the story read non-echoically.

**Story Five.** A direct relationship is suggested by the data between the rates of textual-intraverbals and intraverbals. An inverse relationship is observable between the rates of the two verbal operants and the percentage of the story read non-echoically.

**Story Six.** The predominant relationship observed between the rates of textual-intraverbals and intraverbals was a direct one. This was not a perfect relationship as data point one did not conform to the pattern. An inverse relationship between percentage of the story read non-echoically and the rates of the two verbal operants was indicated by the data excluding the first data point.
Relationship Between Intraverbals and Textual-Intraverbals and Percentage of the Story Read Non-Echoically:
Participant C

Story One. No single relationship is indicated by the data between the rates of textual-intraverbals and intraverbals. An inverse relationship is suggested by the first three data points and a direct relationship is evident across the last three data points. No clear relationship is evident between percentage of the story read non-echoically and the rates of the verbal operants.

Story Two. Participant C emitted no intraverbals during the first reading. An inverse relationship is evident between the rates of textual-intraverbals and intraverbals for the last three data points, with the rate of textual-intraverbals decreasing. No clear relationship is evident between the percentage story read non-echoically and the rates of textual-intraverbals and intraverbals across all four data points. For the last three data points, an inverse relationship is suggested by the data between the rate of textual-intraverbals and percentage of the story read non-echoically. A direct relationship is observable across these three data points between percentage of the story read non-echoically and rate of intraverbals, both measures increasing.

Story Three. A direct relationship is indicated by the data between the rates of textual-intraverbals. The data
suggest a direct relationship between percentage of the story read non-echoically and the rates of the two verbal operants for the first two data points only. The beginning of an inverse relationship is suggested by the last data point.

**Story Four.** A direct relationship is indicated by the data between the rates of textual-intraverbals and intraverbals. The data suggest a direct relationship between percentage of the story read non-echoically and the rates of the two verbal operants for all data points.

**Story Five.** No clear relationship is evident between the rates of textual-intraverbals and intraverbals. A direct relationship is suggested by the first two data points between percentage of the story read non-echoically and the rate of textual-intraverbals. The beginning of an inverse relationship between these two measures is indicated by the last data point.

The relationship most frequently observed between the verbal operants textual-intraverbals and intraverbals was a direct one. On two occasions, a change in relationship from inverse to direct was observed, and on one occasion a change from direct to inverse was noted. The predominant relationship indicated by the data between percentage of the story read non-echoically and the rates of textual-intraverbals and intraverbals was an inverse one. However, several direct relationships ending with an inverse relationship
were observed to occur.

**Summary: Research Question One**

Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the language experience approach? Predominant patterns of responding were identifiable using the measure percentage story read non-echoically. For the three participants these percentages increased with successive readings of the stories. Greater ranges were evident for Participants B and C within and across stories than were present for Participant A. With regard to the relationship between the frequency of textual-intraverbals and intraverbals and the percentage of the story read non-echoically, the most frequently occurring relationship for Participants A and B was an inverse one. For Participant C, the pattern was less clear with a changing relationship observed in three stories.

**Research Question Two**

Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the Mastery Learning reading method in a resource room? Two types of data are presented. The frequency scores of verbal operants which comprised student total responses are presented, and these scores are then converted to percentages of total responses. As the data gathered for the two lessons in each program were very
similar, the actual data from one lesson per program are presented.

Mastery Learning - Decoding A

The data for lesson 55 are presented here. The duration of the lesson was 24 minutes during which the teacher completed seven exercises with the students. The last five exercises were used for homework. During section one, student responding was entirely at the group level. Twenty-eight textual responses were emitted (see Table 14). In section two, one echoic and two intraverbals were emitted, both at the group level. Five group echoic responses were emitted in section three. Six tacts and one echoic were emitted during section four, all group responses. In section five, 61 textual responses were emitted, 37 group responses and 24 individual responses. Sixty textual responses were emitted during section six, 44 of which were at the group level and 16 were individual responses. In section seven, 13 group echoic responses were emitted, and 21 textual-intraverbal responses were emitted. Of the textual-intraverbal responses, 12 were group responses and nine were individual.

A total of 196 responses were emitted during lesson 55. Echoic responding comprised 10.3 percent of the total responding; textual responding comprised 75 percent; tacting represented three percent; textual-intraverbal responding comprised 10.7 percent, and intraverbal responses totaled
Table 14

Frequency of Verbal Operants for Mastery Learning Decoding A

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<th>Lesson Sections</th>
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one percent of the total responses (see Figure 11).

**Mastery Learning - Decoding B**

The data for lesson 89 are presented. The duration of the lesson was 41 minutes during which the teacher completed six exercises. The two remaining exercises were used as homework assignments. During section one, four echoics were emitted, one individual and three group responses (see Table 15). Forty textuals were emitted during section one also, 16 at the group level, and 24 individual responses. Four group echoic responses were emitted during section two, and 68 textual responses were emitted, 33 at the group level and 35 individual responses. During section three, five individual intraverbals, one group level echoic, and 22 textuals were emitted. Of the textuals, eight were at the group level, and 14 were individual responses. In section four, one individual echoic was emitted and 36 individual level textuals were emitted. During section five, 11 textual-intraverbals were emitted as individual responses, and five echoics were emitted, also at the individual level. In section six, one group level echoic was emitted; two textuals, 15 textual-intraverbals, and five intraverbals were emitted, all as individual responses.

A total of 220 responses were emitted during lesson 89. Echoic responding comprised seven percent of total responses, textuals comprised 76 percent, textual-intraverbals represented 12 percent, and intraverbals
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<th>Textuals</th>
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</table>

Table 15

Frequency of Verbal Operants for Mastery Learning Decoding B
Figure 11. Percentage of total student responses by verbal operants for Mastery Learning Decoding A.
toted five percent of total responses (see Figure 12).

Summary: Research Question Two

Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the Mastery Learning method? Using verbal operants to describe student responses in both Mastery Learning programs, Decoding A and B, three-quarters of all responding is textual in nature. Echoic responses and textual-intraverbal responses comprise the next largest percentage of total responses, close to 20 percent.

Research Question Three

What are the major differences in the student learning process, as described in frequency of verbal operants, between the language experience approach and the programs of Mastery Learning examined? The data presented for research question two will be used here. Data in that form for the language experience approach is presented.

Participant A

For story one, 166 verbal operants were emitted by Participant A. Forty-two percent of those were echoics, 46 percent were textual-intraverbals, 11 percent were textuals, and intraverbals comprised one percent of total responses (see Figure 13 and Table 16).

For story two, 94 verbal operants were emitted. Of these, 43 percent were echoics, 40 percent were textual-intraverbals, seven percent were textuals, and ten percent
Figure 12. Percentage of total student responses by verbal operants for Mastery Learning Decoding B.
Figure 13. Participant A's percentage of total responses by verbal operants for Language Experience Approach.
Table 16

Percentage Responses by Verbal Operant Per Story

<table>
<thead>
<tr>
<th>Participants</th>
<th>Echolics</th>
<th>Textual-Intraverbals</th>
<th>Textuals</th>
<th>Intraverbals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story 1</td>
<td>42%</td>
<td>46%</td>
<td>11%</td>
<td>1%</td>
</tr>
<tr>
<td>Story 2</td>
<td>43%</td>
<td>40%</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Participant B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story 1</td>
<td>51%</td>
<td>28%</td>
<td>4%</td>
<td>17%</td>
</tr>
<tr>
<td>Story 2</td>
<td>55%</td>
<td>32%</td>
<td>1%</td>
<td>12%</td>
</tr>
<tr>
<td>Story 3</td>
<td>51%</td>
<td>35%</td>
<td>2%</td>
<td>10%</td>
</tr>
<tr>
<td>Story 4</td>
<td>41%</td>
<td>46%</td>
<td>0%</td>
<td>13%</td>
</tr>
<tr>
<td>Story 5</td>
<td>55%</td>
<td>32%</td>
<td>1%</td>
<td>12%</td>
</tr>
<tr>
<td>Story 6</td>
<td>40%</td>
<td>40%</td>
<td>3%</td>
<td>14%</td>
</tr>
<tr>
<td>Participant C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story 1</td>
<td>47%</td>
<td>33%</td>
<td>2%</td>
<td>18%</td>
</tr>
<tr>
<td>Story 2</td>
<td>50%</td>
<td>37%</td>
<td>3%</td>
<td>13%</td>
</tr>
<tr>
<td>Story 3</td>
<td>48%</td>
<td>34%</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Story 4</td>
<td>56%</td>
<td>33%</td>
<td>2%</td>
<td>9%</td>
</tr>
<tr>
<td>Story 5</td>
<td>45%</td>
<td>40%</td>
<td>1%</td>
<td>14%</td>
</tr>
</tbody>
</table>
were intraverbals. For purposes of visual comparison, story one was chosen.

Participant B

For story one, 310 verbal operants were emitted by Participant B. Of these, 51 percent were echoics, 28 percent were textual-intraverbals, four percent were textuals, and 17 percent were intraverbals (Table 16). For story two, Participant B emitted 266 verbal operants. Fifty-five percent of those verbal operants were echoics, 32 percent were textual-intraverbals, one percent were textuals, and 12 percent were intraverbals. In story three, Participant B emitted 157 verbal operants. Of these, 53 percent were echoics, 35 percent were textual-intraverbals, two percent were textuals, and ten percent were intraverbals. In story four, Participant B emitted 126 verbal operants. Forty-one percent of these were echoics, 46 percent were textual-intraverbals, and 13 percent were intraverbals. Participant B emitted no textuals during the readings of story four. In story five, Participant B emitted 163 verbal operants. Of these, 55 percent were echoics, 32 percent were textual-intraverbals, one percent were textuals, and 12 percent were intraverbals. In story six, Participant B emitted 141 verbal operants. Forty-three percent of these were echoics, 40 percent were textual-intraverbals, three percent were textuals, and 14 percent were intraverbal. For visual comparison, story two was chosen as the most representative for
Participant B (Figure 14).

Participant C

In story one, Participant C emitted a total of 259 verbal operants. Of these, 47 percent were echoics, 33 percent were textual-intraverbals, two percent were textuals, and 18 percent were intraverbals (see Figure 15). In story two, Participant C emitted a total of 130 verbal operants. Of these, 50 percent were echoics, 37 percent were textual-intraverbals, two percent were textuals, and one percent were intraverbals. In story three, Participant C emitted a total of 106 verbal operants. Of these, 48 percent were echoics, 34 percent were textual-intraverbals, eight percent were textuals, and ten percent were intraverbals. Participant C emitted a total of 182 verbal operants in story four. Of these, 56 percent were echoics, 33 percent were textual-intraverbals, two percent were textuals, and nine percent were intraverbals. Participant C emitted a total of 123 verbal operants in story five. Of these, 45 percent were echoics, 40 percent were textual-intraverbals, one percent were textuals, and 14 percent were intraverbals. For visual comparison, the data from story three were used.

The major differences indicated by the data between the language experience approach and the Mastery Learning programs in terms of student responses occurred with the verbal operants echoic, textual, and textual-intraverbal. With regard to echoics, student responses contained a higher
Figure 14. Participant B's percentage of total responses by verbal operants for Language Experience Approach.
Figure 15. Participant C's percentage of total responses by verbal operants for Language Experience Approach.
percentage in the language experience approach than in the Mastery Learning programs. Whereas echoics constituted between seven and ten percent of total student responses in the Mastery Learning programs, echoic responding amounted to between 41 and 56 percent in the language experience approach.

Textuals comprised 75 percent or greater of the total student responses in the Mastery Learning programs. In the language experience approach, between zero and 11 percent of total student responses were accounted for by textuals.

Textual-intraverbals accounted for between 28 and 46 percent of total student responses in the language experience approach. In the Mastery Learning programs, between ten and 12 percent of total student responses were textual-intraverbals.

Summary: Research Question Three

A far higher percentage of student responding in the Mastery Learning programs was textual in nature than in the language experience approach. Most of the responses in the language experience approach were composed of echoics and textual-intraverbals.

Research Question Four

How does the use of the cloze procedure, as an element of the language experience approach, affect student responding in terms of frequency of verbal operants and percent story read non-echoically? Five types of data are presented for Baseline and Intervention conditions for Participant A:
percentage story read non-echoically, rate of verbal operants, duration of story sessions, the relationship between duration and percentage story read non-echoically, and the relationship between the rates of the verbal operants textual-intraverbal and intraverbal and percentage of the story read non-echoically.

**Percentage of the Story Read Non-Echoically**

**Baseline 1.** The percentage of the story read non-echoically ranged from 77 percent to 96 percent in story one, and from 61 to 94 percent in story two (see Tables 17 and 18, and Figure 16). As the mean and median scores are similar, only the mean scores are reported. The mean percentage story read was 90 percent during story one and 79 percent during story two.

**Intervention 1.** The percentage of the story read non-echoically ranged from 84 to 98 percent in story three, from 83 to 97 percent in story four, and from 81 to 91 percent in story five. The mean percentage of the story read non-echoically for stories three, four and five were 91, 88, and 85, respectively. In all three stories, the lowest percentage was higher than the lowest percentages for the two stories in Baseline 1. In stories three and four, the highest percentage values were higher than the highest percentage values for the stories in Baseline 1. There was considerable overlap of data points across both conditions.
Table 17
Percentage of the Story Read Non-Echoically Per Session for Participant A

<table>
<thead>
<tr>
<th>Sessions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>77%</td>
<td>61%</td>
<td>84%</td>
<td>88%</td>
<td>82%</td>
<td>92%</td>
<td>84%</td>
<td>84%</td>
<td>88%</td>
</tr>
<tr>
<td>2</td>
<td>90%</td>
<td>81%</td>
<td>90%</td>
<td>83%</td>
<td>81%</td>
<td>96%</td>
<td>92%</td>
<td>85%</td>
<td>84%</td>
</tr>
<tr>
<td>3</td>
<td>96%</td>
<td>94%</td>
<td>98%</td>
<td>94%</td>
<td>91%</td>
<td>91%</td>
<td>94%</td>
<td>91%</td>
<td>91%</td>
</tr>
<tr>
<td>4</td>
<td>89%</td>
<td></td>
<td></td>
<td>97%</td>
<td></td>
<td></td>
<td>91%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>94%</td>
<td></td>
</tr>
</tbody>
</table>
Table 18

Percentage of the Story Read Non-Echoically Per Story for Participant A

<table>
<thead>
<tr>
<th>Percentages for Stories 1 through 9</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>77-46</td>
<td>61-94</td>
<td>84-98</td>
<td>83-97</td>
<td>81-91</td>
<td>89-96</td>
<td>84-94</td>
<td>84-91</td>
<td>84-94</td>
</tr>
<tr>
<td>Mean</td>
<td>90</td>
<td>79</td>
<td>91</td>
<td>88</td>
<td>85</td>
<td>92</td>
<td>90</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>Median</td>
<td>90</td>
<td>81</td>
<td>91</td>
<td>88</td>
<td>82</td>
<td>92</td>
<td>92</td>
<td>85</td>
<td>89</td>
</tr>
</tbody>
</table>
Figure 16. Participant A's percentage of the story read non-echoically per session. (SSM = Sentence Strip Matching.)
apart from these instances.

**Baseline 2.** The percentage of the story read non-echoically ranged from 89 to 96 percent in story six and from 84 to 94 in story seven. The mean percentages of the story read non-echoically for stories six and seven were 92 and 90 percent, respectively. The lowest percentages here were well within the ranges obtained in Intervention 1. The highest percentages were lower than those obtained in stories three and four of Intervention 1. There was considerable overlap of data points across both Intervention 1 and Baseline 2.

**Intervention 2.** Percentage of the story read non-echoically ranged from 84 to 91 percent for story eight, and from 84 to 94 percent for story nine. The means for stories eight and nine were 88 and 89 percent, respectively. There is overlap of data points between Intervention 2 and Baseline 2. The means for Baseline 2 are descending while those for Intervention 2 were ascending.

Using the dependent variable percentage of the story read non-echoically, no clear effects were noted between Baseline and Intervention conditions. The range of scores decreased with Intervention 1 but did not reverse in Baseline 2.

**Rate Per Minute of Textual-Intraverbal and Intraverbal Operants**

**Baseline 1.** Participant A emitted between 2.7 and 10.8 textual-intraverbals per minute in story one, and between
2.6 and 10.8 textual-intraverbals in story two. The mean rates for stories one and two were 5.3 and 7.2, respectively. Participant A emitted 0.49 intraverbals in session one of story one and did not emit intraverbals in any of the other sessions of this story. No intraverbals were emitted during the first reading of story two. One point six intraverbals per minute were emitted during the second reading and 3.1 per minute in the third.

**Intervention 1.** Participant A emitted between 2.6 and 9.3 textual-intraverbals in story three, between 1.9 and 9.1 in story four, and between 4.1 and 9.8 in the fifth story. The mean rates for stories three, four, and five were 5.4, 5.4, and 6.5, respectively. Participant A emitted between 0.4 and 2.1 intraverbals per minute in story three, between 2.6 and 4.4 in story four, and between 2.4 and 4.4 in story five. The mean rates for intraverbals for stories three, four and five were 1.2, 3.2, and 3.4, respectively. Higher rates of intraverbals were emitted during Intervention 1 than during Baseline 1. There were no differences between the rates of textual-intraverbals in the two conditions.

**Baseline 2.** Participant A emitted between 2.9 and 5.2 textual-intraverbals per minute in story six, and between 3.8 and 6.3 per minute in story seven. The mean rates for these two stories were 4.1 and 5.3. Participant A emitted between 0.6 and 5.2 intraverbals per minute in story six, and between 3.4 and 5.4 intraverbals per minute in story
seven. The means were 3.3 and 4.2. The ranges of rate per minute of textual-intraverbals are narrower in Baseline 2 than they were in either Baseline 1 or Intervention 1.

**Intervention 2.** Participant A emitted between 4.4 and 7.1 textual-intraverbals per minute during story eight, and between 2.9 and 6.1 per minute in story nine. The means for these stories were 5.5 and 4.7. Participant A emitted between 2.2 and 5.3 intraverbals per minute during story eight, and between 0.8 and 3.4 intraverbals during story nine. The means for intraverbals in these stories were 3.2 and 2.5 per minute. There are no major differences evident between rates of textual-intraverbals or rates of intraverbals between Baseline 2 and Intervention 2.

**Duration of Story Reading Sessions**

**Baseline 1.** The duration of story reading sessions ranged from 122 to 168 seconds, with a mean of 149 seconds for story one, and ranged from 100 to 117 seconds with a mean of 109 seconds for story two (Table 19).

**Intervention 1.** The duration of story reading sessions ranged from 135 to 203 seconds for story three, from 126 to 178 seconds for story four, and from 110 to 199 seconds for story five. The means for stories three, four, and five are 166, 155, and 161 seconds, respectively. The ranges were wider for all stories in the Intervention condition than in the Baseline condition.
<table>
<thead>
<tr>
<th>Sessions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>122</td>
<td>100</td>
<td>135</td>
<td>152</td>
<td>110</td>
<td>84</td>
<td>123</td>
<td>102</td>
<td>146</td>
</tr>
<tr>
<td>2</td>
<td>166</td>
<td>109</td>
<td>203</td>
<td>178</td>
<td>199</td>
<td>105</td>
<td>130</td>
<td>159</td>
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<td>3</td>
<td>158</td>
<td>117</td>
<td>159</td>
<td>164</td>
<td></td>
<td>92</td>
<td>157</td>
<td>115</td>
<td>176</td>
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<tr>
<td>4</td>
<td>168</td>
<td></td>
<td>126</td>
<td>175</td>
<td>126</td>
<td></td>
<td>110</td>
<td></td>
<td>146</td>
</tr>
<tr>
<td>5</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>153</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Figure 17. Participant A's percentage of the story read non-echoically and rate of textual-intra-verbal and intra-verbal operants.
Baseline 2. Duration of story reading sessions ranged from 84 to 126 seconds for story six, and from 123 to 157 seconds for story seven. The means for stories six and seven were 102 and 137, respectively. The ranges were narrower again in Baseline 2 than they were in Intervention 1.

Intervention 2. Durations of story reading sessions ranged from 102 to 159 seconds for story eight, and from 146 to 192 seconds for story nine. The ranges for stories eight and nine were 122 and 165 seconds, respectively. In Intervention 2, the duration of story eight was within the range of those stories read during both Baseline conditions.

The story reading sessions had longer durations during the Intervention conditions than during Baseline conditions.

Relationship Between Percentage of the Story Read Non-Echoically and Duration

Baseline 1. No clear relationship is indicated by the data during story one between percentage of the story read non-echoically and duration (Figure 18). With the beginning of sentence strip matching in session four, the duration increased and percentage read non-echoically decreased briefly. In story two, a direct relationship is indicated between the two measures. Both duration and percentage of the story read non-echoically increased with each story reading session.

Intervention 1. No consistent relationship is indicated in story three. A direct relationship is evident for the
Figure 18. Participant A's duration and percentage of the story read non-echoically per session. (SSM = Sentence strip matching.)
Table 20

Frequency of Verbal Operants Per Story for Participant A

<table>
<thead>
<tr>
<th>Verbal Operants</th>
<th>Story 1</th>
<th>Story 2</th>
<th>Story 3</th>
<th>Story 4</th>
<th>Story 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echoics</td>
<td>25</td>
<td>11</td>
<td>6</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
<td>22</td>
<td>10</td>
<td>7</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>Textuals</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Intraverbals</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbal Operants</th>
<th>Story 6</th>
<th>Story 7</th>
<th>Story 8</th>
<th>Story 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echoics</td>
<td>6</td>
<td>3</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Textual-Intraverbals</td>
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<td>8</td>
<td>8</td>
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<tr>
<td>Textuals</td>
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<td>2</td>
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<td>2</td>
</tr>
<tr>
<td>Intraverbals</td>
<td>6</td>
<td>1</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>
first two data points with both variables increasing. Then, as percentage of the story read non-echoically continues to increase, the duration decreases indicating the beginning of an inverse relationship. In stories four and five, an inverse relationship is indicated by the data. In both instances, duration increases, then decreases while percentage of the story read non-echoically decreases and then increases. The more frequent relationship found in the Intervention condition is an inverse one. The only clear relationship indicated in Baseline 1 was a direct one.

Baseline 2. The data for story six indicate a direct relationship for the first two data points and then an inverse relationship for the last two data points. In story seven, a direct relationship between the two variables is indicated by the data. As duration increases, percentage of the story read non-echoically increases also. The predominant inverse relationship suggested in Intervention 1 does not appear in Baseline 2.

Intervention 2. The data for both stories eight and nine indicate an inverse relationship between the measures of duration and percentage story read non-echoically. The directions for this relationship in both stories resemble those for stories four and five in Intervention 1.

An inverse relationship is suggested by the data in both Intervention conditions with duration decreasing and percentage of the story read non-echoically increasing. No
predominant relationship is indicated by the Baseline conditions.

**Relationship Between Verbal Operants Textual-Intraverbal and Intraverbal and Percentage Read Non-Echoically**

**Baseline 1.** It is not possible to identify a relationship between textual-intraverbals and intraverbals as Participant A emitted intraverbals on three occasions out of nine. An inverse relationship is indicated between rate of textual-intraverbals and percentage of the story read non-echoically in story one. The direction of this relationship changes when sentence strip matching takes place. In story two, the relationship suggested by the data between textual-intraverbals and percentage story read non-echoically is also an inverse one. The rate of textual-intraverbals decreases as percentage of the story read non-echoically increases.

**Intervention 1.** The relationship between textual-intraverbals and intraverbals changes from an inconsistent one in story three, to a perfect direct one in story five. In story four, the data indicate a direct relationship for the first three data points. In story three, the data suggest an inverse relationship between rate of textual-intraverbals and percentage story read non-echoically. This inverse relationship is also evident between these two measures in stories four and five. There is, therefore, no major difference between the relationships indicated by the
data between rate of textual-intraverbals and percentage of the story read non-echoically across Baseline 1 and Intervention 1. There is evidence of a strong direct relationship between textual-intraverbals and intraverbals in the Intervention condition.

**Baseline 2.** A direct relationship is indicated by the data between the rates of textual-intraverbals and intraverbals in story six. No consistent relationship is evident between the rates of these verbal operants and percentage of the story read non-echoically. For story seven, a direct relationship is indicated by the data for textual-intraverbals and intraverbals, both decreasing with time. An inverse relationship is evident between the rates of the two verbal operants and percentage of the story read non-echoically. There is no difference in the relationships between textual-intraverbals and intraverbals across Intervention 1 and Baseline 2. This relationship is direct. The relationship between percentage of the story read non-echoically and the rates of the two verbal operants changed for the beginning of Baseline 2 but reverted to that of Intervention 1 in story seven.

**Intervention 2.** A direct relationship is indicated by the data between textual-intraverbals and intraverbals in both stories eight and nine. In both instances, the strongest relationship suggested by the data between the rates of these verbal operants and percentage of the story
read non-echoically is an inverse one. There is no major difference in terms of relationships between the two verbal operants and between these operants and percentage of the story read non-echoically with the introduction of Intervention 1 except for story six in Baseline 2.

Summary: Research Question Four

How does the cloze procedure, instead of sentence strip matching in the language experience approach, affect student responding in terms of frequency of verbal operants and percentage story read non-echoically? For the variable percentage story read non-echoically, no consistent differences were observed after Intervention 1 was introduced. Some higher percentages were achieved with the introduction of the Intervention condition but these cannot be attributed to the Intervention as no reversal was observed in Baseline 2. There were no major differences noted in frequencies of textual-intraverbals between conditions. Intraverbals increased in frequency during Intervention 1 and did not reverse during Baseline 2.

A consistent inverse relationship was observed between percentage read non-echoically and rate of textual-intraverbals in Intervention conditions. This relationship was not as strongly evident in Baseline conditions.
Chapter V
DISCUSSION

This study was conducted to determine the usefulness of using the verbal operants from Skinner's *Verbal Behavior* to describe student responding during the language experience approach to reading instruction. Findings for each of the four research questions are reviewed, contributions to the study of verbal behavior and applied behavior analysis are outlined, limitations of the study are discussed, and suggestions for future research are presented. The chapter concludes with a summary of the study.

Research Question One

Can the verbal operants of Skinner's *Verbal Behavior* be used to describe a learning disabled student's reading behavior as a function of the language experience approach? The measures percentage story read non-echoically and rate per minute of verbal operants provide a description of the language experience approach. This description is best explained by answering the questions: What are the major controlling variables determining student reading behavior during the language experience approach, and how do they change across story reading sessions and across stories?

With the descriptive data generated in this study, it is not possible to identify with certainty the controlling
variables for student reading behavior. However, the data indicate likely sources of control. The major controlling variables for each participant vary, as might be expected. Participant A had more experience with the language experience approach and was considered by the teacher to be ready to move to another reading method by the end of the study. Participants B and C were beginning readers and were taught using this approach for the first time during the course of the study.

For Participant B, the major controlling variable for his reading behavior in early reading sessions seems to be teacher verbalizations. The participant demonstrated low levels of independent reading behavior (three percent, 12 percent, ten percent, and 17 percent read non-echoically), and was highly dependent on teacher modeling. Within stories across sessions, the participant became progressively less dependent on teacher verbalizations and emitted more textual-intraverbal operants. This is an indication of increasing control by the student's own verbal behavior (i.e., intraverbal behavior) because repeated readings of the same story will likely strengthen intraverbal behavior. Through repetition, the student's behavior approximates responding from memory (i.e., pure intraverbal behavior).

The objective of using the language experience approach as reading instruction is to increase control of student behavior by textual stimuli. Increased control by textual
stimuli seems to be indicated by the data for Participant B across stories. Participant B's reliance on teacher verbalizations during first and second sessions decreased progressively across stories (12 percent, 17 percent, 22 percent, 80 percent, 37 percent, and 58 percent read non-echoically during first reading sessions). It is less likely that strong intraverbal behavior would be generated during the first reading sessions. Therefore, it is probable that textual stimuli are exerting more control over the participant's reading behavior in the later first sessions.

For Participant C, decreasing dependence on teacher modeling is evident across story reading sessions. Increasing control by textual stimuli is not clearly evident in the data for this participant as the levels of independent reading for beginning sessions decreased across stories (63 percent, 12 percent, 59 percent, 36 percent, 35 percent story read non-echoically for first reading sessions). Furthermore, the transcripts show that intraverbal behavior strongly controlled his reading behavior. Several times the teacher indicated the student did not have his finger under the word he was reading:

Teacher: "You're not at the right place." Story 1, Transcript 3.

Teacher: "Where's 'cold'? Where's the word 'cold'?" Story 1, Transcript 3.
Teacher: "You see trouble's one word so that that's why we just point once." Story 2, Transcript 2.

Teacher: "There's 'small'. This is 'apartment'." Story 3, Transcript 1.

As the participant was not using textual stimuli on these occasions, nor depending on teacher verbalizations, the most likely source of control is intraverbal behavior.

Participant A demonstrated the highest levels of independent reading of the three participants. Data for the first story sessions show better than 60 percent of the story read non-echoically each session, a level reached by Participants B and C on only one occasion each. For both stories, Participant A read more than 90 percent of the story without teacher help on at least one occasion. Increased textual control is evident in the high levels of independent reading in the early story reading sessions, and in the frequency of pure textuals emitted by Participant A (19 and seven for stories one and two, respectively) indicating efforts to sound out the initial sounds of words.

The occurrences of verbal operants during the language experience approach indicate that the primary source of control over student responding, during the first reading sessions, was teacher verbalizations. At this stage, student responses were mostly echoic. The prompts supplied by the teacher varied from reading whole sections with the students (as with Participants B and C) to providing only
the initial sound of a word (as with Participant A). During the later readings of a story, the major source of control shifted from teacher verbalizations to student intraverbal behavior, as strong intraverbal sequences were reinforced through repeated readings. Across stories, the source of control moved from the student's intraverbal behavior to textual stimuli. As the stories were written products of the students' intraverbal behavior, it was not possible to eliminate intraverbal behavior as a strong source of control even when textual stimuli play a large part in determining student responses.

Accordingly, for students with poor visual discrimination, textual stimuli may exert very weak control over reading behavior initially. If these students have strong intraverbal behavior (if the student can generate verbal sequences in response to verbal stimuli, can relate events, tell stories), then the language experience approach would concentrate on the student's strength and gradually help develop textual behavior. A phonics method would concentrate initially on using textual stimuli to teach reading behavior.

The sequence observed in student verbal behavior when transferring from an intraverbal repertoire to a textual repertoire was from echoic operants to textual-intraverbal operants to textual operants. This finding supports that of McDowell (1968) when students were taught to read by first
echoing responses, then developing intraverbal sequences, and finally depending on textual stimuli.

Research Question Two

Can the verbal operants of Skinner's Verbal Behavior be used to describe a learning disabled student's reading behavior as a function of the Mastery Learning reading method in a resource room? Using the same definitions of verbal operants that were used to address question one, it is clear from the data that the responses most frequently made by students in both Mastery Learning programs (Decoding A and Decoding B) were textual operants (75 percent and 76 percent). As defined earlier, one of the antecedent conditions setting the occasion for the emission of a textual operant was the presentation of a text containing one word. The student's response was the proper name of the stimulus. No context was provided for the student as a supplementary source of control over responding. This was the antecedent condition setting the occasion for student textual behavior present during the Mastery Learning programs. The second antecedent condition and student response (presenting text with more than one word, and the attempts by the student to read one of the words phonically) were not present in the tapes of the Mastery Learning lessons. Very little responding was under the control of teacher verbalizations (10.7 percent and seven percent for Decoding A and B, respectively). To emit correct responses during the Mastery
Learning lessons, a student would need to rely heavily on textual behavior. However, as much of the responding was choral (72 percent for Decoding A and 28 percent for Decoding B, excluding echoics), it would be possible for a student within a group of three to four students to emit echoic responses some of the time. The student could respond fractionally behind the other students, thus echoing their responses. The teacher attempted to prevent this by insisting that responses were in unison. Both Mastery Learning programs place a heavy emphasis on phonics and do not use the student's intraverbal behavior to generate reading material.

Research Question Three

What are the major differences in the student learning process, as described in frequency of verbal operants, between the language experience approach and the Mastery Learning reading methods? Three major differences were noted between the methods. First, echoic operants comprise a much higher percentage of total responses in the language experience approach than in the Mastery Learning methods (42 percent, 55 percent, 48 percent for Participants A, B, and C in the language experience approach, and 10.3 percent and seven percent for Mastery Learning programs A and B, respectively). There is less dependence on teacher modeling of correct reading responses in the Mastery Learning programs.
Second, the highest percentage of student responses in the Mastery Learning programs was student textual behavior (75 percent and 76 percent). Textual responses comprised a much smaller percentage of total student responses in the language experience approach (11 percent for Participant A, one percent for Participant B, and eight percent for Participant C).

Third, textual-intraverbal responses totaled higher percentages for the language experience approach (46 percent, 32 percent, and 34 percent for Participants A, B, and C, respectively) than in either Mastery Learning program (10.7 percent and 12 percent for Decoding A and Decoding B, respectively). The textual-intraverbal behavior required of students by both Mastery Learning programs was more difficult for students as the text was not a written product of the students' own intraverbal behavior. The text was supplied by the programs.

The most critical difference between the language experience approach and the Mastery Learning approach to reading instruction is the amount each program relies on student intraverbal behavior. Because the language experience relies more heavily on student intraverbal behavior and gradually moves toward providing greater control by textual stimuli, this method might profitably precede use of the Mastery Learning programs.
Research Question Four

How does the use of the cloze procedure, as an element of the language experience approach, affect student responding in terms of frequency of verbal operants and percentage story read non-echoically? The use of the cloze procedure required more time of the teacher. Mean durations of stories one and two were 149 and 109 seconds, respectively. Mean durations for the intervention stories three, four and five were 166, 155, and 161 seconds, respectively. This may seem to be a disadvantage of using the method. However, the mean durations for the stories in baselines one and two were lower because the student completed the sentence strip matching activity without teacher prompts or directions. Participants B and C required teacher assistance when they were matching the sentence strips and the durations for their stories were far longer than those for Participant A (for example, duration for story three, Participant B, was 473 seconds). Participant A had acquired the skill of sentence strip matching and was learning to read stories and supply the missing words in the cloze procedure. The learning process understandably took more time.

The highest percentages of the story read non-echoically increased from Baseline 1 to Intervention 1 but did not remain consistently higher during the intervention condition. Participant A continued to read a high percentage of the stories without teacher help during Baseline 2 and
Intervention 2. Using the dependent variable, percentage story read non-echoically, no differences in behavior were noted across baseline and intervention conditions. It is likely that the student's improvement in reading skills across all story reading sessions was a stronger variable than the use of the cloze procedure. No major differences were observed between baseline and intervention conditions for the rates of the verbal operants textual-intraverbal and intraverbal.

The teacher reported increased motivation by Participant A when the cloze procedure was introduced. The student reported to both the teacher and the experimenter that she did not like matching the sentence strips. Although the student during the intervention conditions was learning a new skill, she maintained very high percentages of story read non-echoically. The teacher had expressed concerns at the beginning of the study about using this student, as the student had been having motivational problems reading with the language experience approach. Whereas the use of the cloze procedure did not result in any substantial improvement of behaviors measured by the dependent variables, the participant was more highly motivated during the presence of the intervention procedure. It is not possible to say whether a different change in procedure would have resulted in the same improvement in motivation.
Contributions

This study contributed to the study of verbal behavior and applied behavior analysis in three ways. First, the present study expands the literature on verbal behavior as it provides a description of an instructional process using verbal operants from Skinner's *Verbal Behavior*. It is the first attempt to analyze and describe the language experience approach to reading instruction using verbal operants. The literature on verbal behavior and instruction has been mainly concerned with making instructional practices more efficient (Vargas, 1978; Johnson & Chase, 1981), or devising new instructional methods (McDowell, 1968). No studies were found which analyzed a successful instructional method as it was used in the classroom.

Second, the use of the category "textual-intraverbal" in this study allowed acknowledgement of the supplementary role of the student's intraverbal behavior when reading a story which was a written product of the student's own intraverbal behavior. The results of the first three research questions support the conclusion of McDowell's (1968) study by asserting the importance of the contribution by intraverbal behavior to the acquisition of textual behavior.

Third, this study devised a framework for comparing the response demands made of students across reading methods. Using verbal operants to describe student responses, it was possible to explain when one method of reading instruction
(the language experience approach) might be more suitable than a second method (Mastery Learning) for students with particular skills and skill deficits.

**Limitations**

Three limitations to the present study were evident. First, the description of the language experience approach generated by analyzing the responses of students using verbal operants did not permit the identification of controlling variables. No attempts were made to examine the effects of one variable by changing it while maintaining the conditions of the study for all other variables. The results presented suggest a description. They do not confirm one. Only experimental manipulation of variables across time would enable functional relationships to be identified between student responses and text or teacher behaviors. The limited time frame of the study prevented access to such data. Also, the language experience approach to reading instruction is not used for periods much longer than the ten weeks of data collection of this study for any one student. It is usual for a very small number of students (one to four) to be instructed using this approach in any one school year.

Second, the framework devised for comparison of student response requirements between reading methods did not reflect the time spent responding by verbal operants. The percentage of total responses in each verbal operant class
was calculated from a frequency count. The frequency count
did not reflect the duration of responding for any verbal
operant. High frequencies of responding in any verbal
operant class did not necessarily mean large percentages
of the lesson time were used for those responses. The dis-
tribution of verbal operants in student responses for the
Mastery Learning programs was very discrete. Textual
responses were required for one exercise. Intraverbal
responses were required for another. The language exper-
ience approach, as it was far less teacher directed, did not
break down easily into sections in which specific responses
were required. Students emitted textuals, intraverbals,
and echoic operants all in one-sentence response on many
occasions. Therefore, it would be very difficult to measure
the durations of certain verbal operants, particularly
echoics and textuals, in the tapes for the language exper-
ience approach.

Third, the short time frame for the intervention section
of this study was a major limitation to assessing whether
the cloze procedure produced differences in student respond-
ing. It was expected that the student would improve at
reading text and supplying missing words with time. The
time limitation did not permit choosing a third dependent
variable, such as textual behavior using a text not a pro-
duct of the student's intraverbal behavior, to assess
differences in reading skills.
Future Research

Future research should be directed to remedying the limitations of this study: No conclusive identification of sources of control over student responses, the absence of time as a descriptor when considering the percentage of total responses per verbal operant in different reading programs, and the limitation of time and number of students when analyzing intervention effects in the language experience approach.

Future research could replicate the first part of the present study early in the school year. More students might then be available during the second semester to allow experimental investigation of the sources of control of student responses. Student performance on reading tests and psychological tests could be co-related to performance in rereading the stories used. Researchers could address questions of prerequisite skills for successful placement in a program of reading instruction such as the language experience approach. Such questions might be: Does the student need to understand word concept (written and oral)? Is the percentage story read non-echoically affected by the strength of the student's intraverbal behavior (i.e., the ease with which the student relates events or tells a story)? Could a student with mental retardation emit intraverbal behavior which would be of sufficient strength to be used as a story in the language experience approach?
Reading methods other than those examined in this study could be analyzed by researchers to discover the types of student responding required. If this was done, it might be possible to devise a screening instrument which would identify the reading approach or approaches most likely to be effective with individual students.

A dependent variable measure, independent of the language experience approach, could be developed to assess student reading progress. Such a measure could include an assessment of strategies used by students to read material not generated by them. These strategies could be taught explicitly and would include developing intraverbal behavior sequences useful for predicting what should happen in a story, and developing textual behavior by focusing attention on phonic skills.

A final suggestion for future research arises, not out of the limitations of the study, but from one of its findings. The student with the most experience in the language experience approach achieved the highest scores for percentage story read non-echoically. Future researchers could further investigate this measure as a proficiency indicator which might assist teachers to quantify their professional judgment. For example, is achieving greater than 85 percent story read non-echoically in at least two consecutive readings of a story, an indication that the student could then move to a reading instruction method less dependent on the
student's intraverbal behavior? Could a teacher be taught to assess percentage story read non-echoically quickly and use this measure to assist professional opinion?

In summary, experimental studies need to determine definitively the variables controlling student verbal behavior during language experience approach lessons. Comparisons need to be made between many different reading approaches to attempt to match reading approaches as early as possible with individual student's strengths. The use of the language experience approach to reading instruction with students with mental retardation needs to be investigated. Finally, percentage story read non-echoically could be developed to see if it could be used to supplement and quantify teacher judgment.

Summary

Research Problem

The purposes of the study were threefold. The first purpose was to examine the usefulness of using the verbal operants from Skinner's Verbal Behavior to describe the responses of a student with learning disabilities in the language experience approach to reading instruction. The second purpose was to compare student responding as a function of the language experience approach and as a function of two Mastery Learning approaches. The third purpose was to investigate whether substituting the cloze procedure for sentence strip matching would change student response
patterns using the language experience approach. Two dependent variables were used; percentage story read non-echoically and rate per minute of textual-intraverbal and intraverbal operants. Percentage story read non-echoically was used because it gave an indication of the student's independent reading skill. Rate of verbal operants was used to supplement the first dependent variable and to provide a description of student responses.

The cloze procedure was the independent variable for Participant A in the language experience approach. The cloze procedure was chosen because the teacher had an interest in using it, and the literature supported its usefulness as a component of the language experience approach. The cloze procedure consisted of deleting every fifth word for the second and subsequent readings of the student's stories. The first letter or letter combination was not deleted.

The variation of the language experience approach used in the study included three to six readings of a story transcribed from a student's dictation. Cut-up sentence strips of the story were put in order by the student, and the words in the story were presented as flashcards during the last reading session.

The Mastery Learning programs used were Word-Attack Basics, Corrective Reading, Decoding A (1978), and Decoding Strategies, Corrective Reading, Decoding B (1978).
Method

The participants were two first-grade boys and one sixth-grade girl with learning disabilities who attended a resource room for instruction in an urban elementary school. Two lessons each for the Mastery Learning programs were audiotaped and transcripts of the tapes were made. The language experience approach lessons for the three participants were audiotaped for ten weeks, and transcripts of these tapes were made. All transcripts were segmented into verbal episodes, and verbal operants within verbal episodes were identified.

For the Mastery Learning lessons, the data were presented as percentages of total student responses per verbal operant. Percentage story read non-echoically was calculated for each participant for every story reading session in the language experience approach lessons. Rate per minute of the verbal operants textual-intraverbal and intraverbal were plotted on five cycle semi-log paper for each story reading session.

The effectiveness of using the cloze procedure was assessed using a reversal design (Baer, Wolf, & Risley, 1968) with two language experience stories for Baseline 1, three for Intervention 1, and two stories each for Baseline 2 and Intervention 2. To facilitate comparison between the language experience approach and the Mastery Learning method, the data for one story per participant for the language
experience approach was displayed in percentage of total student responses per verbal operant.

Results and Conclusions

An independent observer scored the responses of participants in five verbal episodes per transcript, 20 verbal episodes in all. The total average agreement score for the three participants was 95 percent. The overall agreement score was 92 percent for Participant A, 98 percent for Participant B, and 95 percent for Participant C. An independent observer verified that the procedures for baseline and intervention were carried out as described by the experimenter. Accuracy of the transcripts, counts of verbal operants, duration of lessons, and percentage story read non-echoically were verified by the independent observer.

The highest percentages story read non-echoically were recorded for Participant A, with means of 90 percent and 79 percent for stories one and two. The mean percentages story read non-echoically for Participant B were 30 percent, 58 percent, 55 percent, 85 percent, 57 percent, and 70 percent for the six stories. For Participant C, the mean percentages story read non-echoically were 71 percent, 62 percent, 73 percent, 54 percent, and 64 percent for the five stories. There were few differences in the rate of the verbal operants textual-intraverbals and intraverbals across the three participants with means for Participant A ranging from 5.3 to 7.2 for textual-intraverbals for stories one and two. The means
for textual-intraverbals for Participant B ranged from 3.6 in story one to 5.7 in story five, and means for intraverbals ranged from 0.8 to 2.2 in stories one and five. The means for textual-intraverbals for Participant C ranged from 3.3 in story one to 5.7 in story four, and the means for intraverbals ranged from zero to 4.1 in stories two and five. Story reading sessions lasted an average of 136 seconds for Participant A, 257 seconds for Participant B, and 191 seconds for Participant C. The dominant relationship observed between percentage story read non-echoically and rates of textual-intraverbals and intraverbals was an inverse one. As percentage story read non-echoically increased, rate of verbal operants decreased.

The description of the language experience approach generated through analysis, using verbal operants, indicates that the primary source of control over student responding, during the first reading sessions, is teacher verbalizations. At this stage, student responses are mostly echoic. During the later readings of a story, the major source of control shifts from teacher verbalizations to student intraverbal behavior, as strong intraverbal sequences are reinforced through repeated readings. Across stories, the source of control moves from the student's intraverbal behavior to textual stimuli. As the stories are written products of the students' intraverbal behavior, it is not possible to eliminate intraverbal behavior as a strong source of control.
even when textual stimuli play a large part in determining student responses.

Data from the Mastery Learning programs Decoding A and Decoding B were converted to percentages for the verbal operants in students' responses. A total of 196 responses were emitted during the lesson from Decoding A. Echoic responding comprised 10.3 percent of the total responding, textual responding comprised 75 percent, tacting represented three percent, textual-intraverbal responding comprised 10.7 percent, and intraverbal responses totaled one percent of the total responses.

A total of 220 responses were emitted during the lesson from Decoding B. Echoic responding comprised seven percent of total responses, texturals comprised 76 percent, textual-intraverbals represented 12 percent, and intraverbals totaled five percent of total responses.

Three major differences were noted between the methods. First, echoic operants comprise a much higher percentage of total responses in the language experience approach than in the Mastery Learning methods (42 percent, 55 percent, 48 percent for Participants A, B, and C in the language experience approach, and 10.3 percent and seven percent for Mastery Learning programs A and B, respectively). There is less dependence on teacher modeling of correct reading responses in the Mastery Learning programs.

Second, the highest percentage of student responses in
the Mastery Learning programs was student textual behavior (75 percent and 76 percent). Textual responses comprised a much smaller percentage of total student responses in the language experience approach (11 percent for Participant A, one percent for Participant B, and eight percent for Participant C).

Third, textual-intraverbal responses totaled higher percentages for the language experience approach (46 percent, 32 percent, and 34 percent for Participants A, B, and C, respectively) than in either Mastery Learning program (10.7 percent and 12 percent for Decoding A and Decoding B, respectively). The textual-intraverbal behavior required of students by both Mastery Learning programs was more difficult for students as the text was not a written product of the students' own intraverbal behavior. The text was supplied by the programs.

The most critical difference between the language experience approach and the Mastery Learning approach to reading instruction is the amount each program relies on student intraverbal behavior. Because the language experience relies more heavily on student intraverbal behavior and gradually moves toward providing greater control by textual stimuli, this method might profitably precede use of the Mastery Learning programs.

Data for Participant A for the baseline and intervention conditions indicated no functional relationship between the
use of the cloze procedure and percentage story read non-echoically or rate of textual-intraverbals and intraverbals. Percentages read non-echoically remained high across all conditions with a mean of 86 percent for Baseline 1, 88 percent for Intervention 1, 91 percent for Baseline 2, and 89 percent for Intervention 2. There was considerable overlap of data points across all conditions. It is likely that improvement in reading skills had greater influence on student behavior, as measured by the dependent variables, than the introduction of the cloze procedure. Student motivation did improve during the intervention conditions.

In conclusion, the use of verbal operants to describe student learning during the language experience approach to reading instruction provides useful information on the transfer from an intraverbal to a textual repertoire as the student learns to read. This type of analysis also provides a basis for comparing the response requirements for two different reading methods.
APPENDIX A

Sample Transcripts with Verbal Episodes

and Verbal Operants
Teacher: Today we’re going to reread your snowman story and then I want you to make me a picture of how you make a snowman. OK?

Chi: Alright

Teacher: OK. Let’s read this.

Together: How to make a

Chi: snowman.

Together: You roll the snow

Chi: man

Teacher: in

Chi: in

Together: a ball. And

Chi: then

Together: you roll another piece into a ball. You roll another piece into a ball. Then you put

Teacher: the

Together: the biggest one on the bottom. You put the middle sized one on.

Chi: the

Teacher: top
Teacher: I want you to reread your Clifford story for me - OK?

Teacher: Clifford

R: Clifford the small red dog.

Teacher: Clifford

R: Clifford

Teacher: Clifford

R: Clifford

Teacher: our

F: lost in

Teacher: our

F: our small

Teacher: apartment

F: apartment.

Teacher: When

R: when

Teacher: my

R: my

Teacher: father

R: father got home he looked a lot bigger. He - and
Teacher: tell

M1: tell about your project and then - and

Together: they

M1: would ask questions and then

Teacher: they

M1: then they

Teacher: No, not then, and

M1: and

Together: they

M1: would look at your project

Teacher: diagram

M1: diagram. They asked me if I read some books about - and I said No but I read so-

Together: them

M1: with my teacher. Then

Together: they

M1: asked me who was the tallest. I said at first the boys were, the - and

Teacher: the
APPENDIX B

Training Manual
TRAINING MANUAL

Study the definitions and examples of the verbal operants echoic, textual, intraverbal, and textual-intraverbal given below. When you are thoroughly familiar with the definitions and examples, turn to the Decision Log which gives rules for special cases. Then the experimenter will administer an oral test. You will be expected to achieve 100 percent accuracy on both definitions and identification of verbal operants within examples.

Definitions

Echoic. An echoic is a verbal operant whose controlling variable is one's own or another speaker's verbal behavior and whose verbal response reproduces the stimulus.

A typical example is the following: A parent says to a child, "Say 'dog'", the child says "dog", the parent reinforces the child. Echoics can be as short as one sound and as long as several words or sentences.

Textual. A textual is a verbal operant whose controlling variable is writing, printing, pictures, etc., and whose verbal response is functionally equivalent to the proper name of the stimulus.

For example, a teacher presents the word "black" printed on a flashcard to a student and says, "Read this word, please." If the student responds, "Black", this response would be a textual.
**Intraverbal.** An intraverbal is any verbal response whose controlling variable is the speaker's own or any prior verbal response.

An example of an intraverbal chain would be completing the expression: "Red, white, and ---" with the word "blue". In reading, intraverbal behavior is often evident when an individual 'reads' a word he/she 'thinks' should follow other words, rather than the actual word on the page (i.e., the reader substitutes a word for the printed word).

**Textual-Intraverbal.** Textual-intraverbal will be applied in this study to all utterances of the Participants which are made in response to the text and which are not echoics, textuals, or intraverbals.

An example of identifying textual-intraverbals would be the following: The text reads, "If your cold is better in the morning, I will fix you some hot soup." The transcript of student responses reads:

Teacher: If your cold
Student: If your cold is better in the morning, I will make you some hot soup.

In the student's response, the phrase "if your cold" is an echoic, and the word "make" is an intraverbal. As there are no textuals, the remainder of the utterance is a textual-intraverbal.
APPENDIX C

Decision Log
DECISION LOG

For special cases of echoic operants, apply the following three rules:

1. Utterances emitted together are counted as echoics.
   Example:
   Teacher:  he went home
   Student:  and
   Together:  he went
   The utterance "he went" by both teacher and student together is an echoic.

2. When the teacher prompts the student by giving the first sound or first syllable of a word, and the student then reads the word correctly, the student's response is an echoic.
   Example:
   Student:  he went rolling down the
   Teacher:  hi-
   Student:  hill
   The student's response "hill" is an echoic.

3. No more than two words uttered by either teacher or student, or a combination of both, can intervene between the stimulus provided by the teacher and the student's response in order for that response to be an echoic.
Example:
Teacher: he went
Student: and he went
The student's response "he went" is an echoic.

Nonexample:
Teacher: he went, say it
Student: and he went
The student's response "he went" is not an echoic as three words intervened between stimulus and response.

The only textuals which can be identified from the transcripts will be student attempts to read a word by sounding out the first sound of that word.

Example:
Text reads "the black cat"
Student responds, "the b-bl-b..."
The student's effort "b-bl-b" is a textual.
APPENDIX D

Test Questions
TEST QUESTIONS

1. Give the definition of an echoic.
2. Give the definition of a textual.
3. Give the definition of an intraverbal.
4. How would you define a textual-intraverbal?
5. What is the controlling variable in the echoic?
6. What is the controlling variable in the textual?
7. What is the controlling variable in the intraverbal?
8. What must you check the transcript for first before you can identify textual-intraverbals?

Identify the verbal operants in the following examples:

1. The student copies what the teacher said exactly.
2. The student reads a word when it is presented on a flashcard.
3. The student reads a phrase with the teacher.
4. The student substitutes a word for the actual word in the text.
5. The student reads "watched" for "saw".
6. The student attempts to read a word by sounding out the first sound.
7. With all echoics, textuals, and intraverbals identified, the remaining student utterances are _________.
8. The student reads a sentence from the text with no echoics, textuals, or intraverbals.
APPENDIX E

Cloze Procedure Stories
The Dirty Dog

One day there was a d—
named Lois. She was a c—
little dog. But she f— in a
puddle and s— had to take a
b— because she was dirty. S—
got a bath. Three p— helped
her to take a b—. Paula got
some soap, Billy g— some water,
and Sam got the b—. But
Lois didn't want to go in the
b—, because she doesn't like
b—. So she licked Billy in the
f—. He moved his face b— and
Lois jumped out of the b—
and chased a kitty c— down
the street. Lois f— over her
own two f— right into a puddle.
Mr. and Mrs. Tuck found her in the woods. She was ready to drink magical water from the spring. It would keep her from growing. They took Winnie away. They took her to their house. Then Mr. and Mrs. Tuck said she could stay there. The stranger came to take Winnie away. But Mrs. Tuck said, "No, you can't take her." She hit the stranger on the head with a gun. The stranger died. The sheriff put Mrs. Tuck in jail. Winnie took Mrs. Tuck's place in jail. Their secret was safe. No one would know about the spring. The End.
My Best Friend

My best friend is Mrs. R____. She is very nice t____ me. She is small and sh____ has brown hair and sh____ has brown eyes. When am sad she gives m____ hugs. I am lucky t____ have her for a f____.

She's a teacher and she h____ students. She does spelling t____ and she runs off d____ for our teacher. Sometimes sh____ talks with people about th____ problems like if they're in tr____.

She's a very funny p____.
The Day at the Zoo

One day me and my b____ went to the zoo. We s____ the seals. They are n____ to watch in water. My b____ was drawing the animals. I s____ a boy feeding the a____ and the sign said "D____ feed the animals." But he d____ the rule and he f____ the animals. The zoom____ was going across the b____ and saw this boy f____ the animals. The manager s____ "Please don't feed the a____ or you'll get in t____. Don't you see the s____?" The boy said, "Yes, I s____ the sign." The boy said, "I th____
the animals were starving
so I did the sign.

The End.
The Raccoon Never Gets In Trouble

It was about this raccoon. His mother and father always trusted him with these baby chipmunks. They always got on his nerves. The chipmunks were running up trees. And then the raccoon said, "Let's play a game." Hide and Go Seek. And they played. Then one of the chipmunks got lost in the forest. The raccoon called his name. And his sister was getting worried. She called his name. She said, "Nipala!" And he was plumped in a tree right nearby.

He was eating walnuts. They all got together and were eating walnuts!
APPENDIX F

Teacher Interview
POST-STUDY INTERVIEW WITH TEACHER

Experimenter: Why do you use the sentence strip matching activity?

Teacher: First of all, it was introduced to me in a class at Ohio State (Dr. Zutell) as one way to start off readers who were not ready for a basal reading series. And, another reason I chose to use it is that it focuses on the child's own language. That's really important for someone who's having trouble starting to read. I feel it helps with word discrimination, when they aren't sure exactly what a word is; sentence discrimination, in seeing that there is a beginning and ending to a sentence. And also, it helps them with initial consonants because, if they don't know the word, they right away start to key in on: "Well, it starts with a 'b', so I'm going to say something that starts with that sound." And those are all reading readiness skills that would allow them to move into more difficult reading.

Experimenter: What skill do you think is taught using the cloze procedure?
Teacher: I think it continues - the way we used it with an initial consonant supplied - helped them to use not only the initial consonant sound to supply the word, but also the contextual clues. And those are two skills that I would consider next in line for what's important to learn.

Experimenter: That relates to the next question. How would you rank the two in terms of which one you would teach first?

Teacher: I would start with just the matching, something where they recognize that yes, this word is the same as that word.

Experimenter: How would you use your judgment to decide to move from sentence strip matching to the cloze procedure?

Teacher: Since you're constantly monitoring the child while they're reading, you get a sense right away of when they start to catch on to initial consonant, and sentence and word discrimination. And so you'll know right away when that becomes very easy and they'll say, "Oh, I can do this in a minute." And indeed they'll do it very fast. That would be a time then when they might move on to the cloze procedure.
Experimenter: Would you use the cloze procedure with some other students when you'd use language experience with them in the future?

Teacher: Yes, especially older students. I think initially contextual clues are not one of the first things they learn to do when they're starting to read. So I might use that with older students or might go back and use it with my younger students after they learn to read a little more efficiently.

Experimenter: What do you think using the cloze procedure contributed to the progress of Student A?

Teacher: She felt it was a more advanced skill, so she didn't feel it was such a primary thing to do. And it gave her a feeling of competence because she was able to do it with a lot of ease. So she saw it as being more difficult and then she saw herself doing very well, so it gave her a lot of confidence.

Experimenter: Do you feel that using the cloze procedure is worth the extra time it required of you?

Teacher: Yes, because even at that, it was not a great deal of time. It was still a lot less than a lot of my other reading programs.
My room is very small.

My room is very ugly.

My rug is green and it doesn't match anything.

The wallpaper is coming off of the walls. The wallpaper is coming off of the walls. The wallpaper is coming off of the walls.

I have two dressers, a bed, a bookshelf, and a nightstand.

That's all the furniture I have in my room. There is nothing by the wall.

I have a closet for my clothes, and on the walls. I have two dressers.
The rest are pants. I feel terrible about my room because it is so small.
The Day at the Zoo

One day me and my brother went to the zoo. We saw the seals. They are neat to watch in water. My brother was drawing the animals. I saw a boy feeding the animals and the sign said "Don't feed the animals. But he disobeyed the rule and he fed the animals. The zoo manager was going across the bridge and saw this boy feeding the animals. The manager said "Please don't feed the animals or you'll get in trouble. Don't you see the sign? The boy said "Yes, I see the sign." The boy said "I thought
the animals were starving 
so I disobeyed the sign. 
The End.
Teenage Suicide

They are teenagers and they might do something. They think nobody listens to them so they kill their self or something. I don't think it would be fair to their parents, because the parents really love their kids and they shouldn't do something wrong that their parents say they shouldn't. Suicide wouldn't be a good way out of an argument.
THE SCIENCE FAIR

MY PROJECT WAS WHO'S THE TALLEST: SIXTH GRADE GIRLS OR SIXTH GRADE BOYS. THE SIXTH GRADE GIRLS WERE THE TALLEST. I GOT AN EXCELLENT RIBBON. YOU HAVE TO TELL ABOUT YOUR PROJECT AND THEY WOULD ASK QUESTIONS, AND THEY WOULD LOOK AT YOUR DIAGRAM. THEY ASKED ME IF I READ SOME BOOKS ABOUT IT. I SAID NO, BUT I READ THEM WITH MY TEACHER. THEY ASKED ME WHO WAS THE TALLEST. I SAID AT FIRST THE BOYS WERE THE TALLEST. THEN THE GIRLS WERE THE TALLEST. THE BOYS WERE THE TALLEST AT FIRST BECAUSE WE MADE A MISTAKE.
The Dirty Dog

One day there was a dog named Lois. She was a cute little dog. But she fell in a puddle and she had to take a bath because she was dirty. She got a bath. Three people helped her to take a bath. Paula got some soap, Betty got some water, and Sam got the bucket. But Lois didn't want in the bucket because she doesn't like baths. So she licked Betty in the face. He moved his face back and Lois jumped out of the bucket and chased a kitty cat down the street. Lois (fell over her own two feet) right into a puddle.
My Mom's Having a Baby

Monday morning my mom got a blood test to see if she was pregnant. Tuesday she found out she was. And she was so happy. After school Tuesday I came home and she said, "I'm having a baby, I'm having a baby!" I said, "Congratulations Mom!" I asked her what she wanted a boy or a girl. She said, "I want a girl." I don't mind if it's a boy or a girl because I already have sisters and brothers.
The Raccoon Never Gets IN Trouble

It was about this raccoon. His mother and father always trusted him with these two baby chipmunks. They always got on his nerves. The chipmunks were running up trees. And then the raccoon said, "Let's play a game." - Hide & Go Seek. And they played. Then one of the chipmunks got lost in the forest. The raccoon called his name. And his sister was getting worried. She yelled his name. She said, "Nipal, Nipal!" And he was playing in a tree right near by. He was eating walnuts. They all got together and were eating walnut
Mr. and Mrs. Tuck found her in the woods getting ready to drink magical water from the spring. It would keep her from growing. They took Winnie away. They took her to their house. Then Mr. and Mrs. Tuck said she could stay there. The stranger came to take Winnie away. But Mrs. Tuck said, "No, you can't take her." She hit the stranger on the head with a gun. The stranger died. The sherriff put Mrs. Tuck in jail. Winnie took Mrs. Tuck's place in jail. Their secret was safe. No one would know about the spring.

The End
My Best Friend

My best friend is Mrs. Riddle. She is very nice to me. She is small and (she) has brown hair and (she) has brown eyes. When (I) am sad she gives (me) hugs. I am lucky to have her for a friend.

She's a teacher and she helps students. She does spelling tests and she runs off ditto's for our teacher. Sometimes she talks with people about their problems like if they're in trouble. She's a very sunny person.
Charlie's New Wagon

Charlie went to ride his wagon. It was red. The wheels were yellow. And he rode it. He had to get in the wagon. He pulled the wagon. He made it go by rolling down the hill. He went home. He left the wagon in his front yard and it got stolen. He was sad when it got stolen. He called the police. The man brought it in. He got it and the man said, "I'm sorry." He took it because he had a son. The End.
Morris Has a Cold

One day Morris the Moose said, "I have a cold. My nose is walking." Boris the Bear said, "You mean your nose is running." No, said Morris. My nose is walking. I only have a little cold. "I am getting hungry." All right," said Boris. But you have to stick out your tongue first. Your belly looks hungry. I will make you some hot soup. Put the spoon in your mouth." Ha, Ha!" "No, No," said Boris. It is getting dark. If your cold is better in the morning I will fix you hot soup. R-r-r-r-r-r. The End
How to Make a Snowman

Put a hat on the top of a carrot for a nose. You could make a mouth and eyes. You could also use buttons for eyes.

Decorations on the snowman's side: one. Then you put little balls on the middle. And then you put the top of the big one on the middle. Side one on the bottom. You put the biggest one on the into a ball. Then you roll another piece into a ball. You roll the snow in.
There is the snowman

Put a jacket on him

Body made out of snow

Put some arms on the

Bottom of the snowman

You put boots on the

Put buttons for the head.
Clifford the Big Red Dog

Hi. I'm Emily. I have a big red dog named Clifford. He is the biggest dog in the whole wide world. He sometimes makes mistakes. I throw a stick and he brings it back to me. We play hide and go seek. Clifford is easy to find. He is easy to find because he is so big.

We don't go to the zoo any more because he gets into the animals. He likes to chew shoes.

The End
When the Cow Sneeze

Once upon a time a cow sneezed.
He jumped on a bicycle and he rolled down the street.
And he bumped into the ferris wheel.
He rolled into the water.
He sneezed out of the water.
He bumped into the ferris wheel again and he went into the zoo.
Elephants got on the ferris wheel.
They busted out of the zoo and rolled down the street.
They flattened everything out.
But the cow didn't get runned over.

The End
Clifford the Small Red Dog

Clifford gets lost in our small apartment. When my father got home, he looked a lot bigger. He said I don't think Clifford, the small red dog, is going to live through the winter. I was sad. So was he. I took him for a walk. I looked around the corner and saw a big dog. I thought I would pick Clifford up. That is the end of this story.
Brian and the Wagon

Brian got into the wagon because he was tired. He was running with his dog, Clifford, and trying to get the stick away from him.

He got out of the wagon because he wasn't tired any more.

He went to the other side of the wagon because the ground was all muddy. He put grass over the mud. The grass grew and grew and grew. Over night it seemed to get bigger and bigger and bigger. At midnight I looked out my window. It was very big. It was as big as a house. That is the end of this story.
Morris Has a Cold

He could not go to school because he said, "My nose is walking."
"You do not mean your nose is walking. You mean your nose is running," said Boris. "My nose is not running because I only have a little cold," said Morris. "I will give you a cough drop," said Boris the Bear. Boris gave it to him and then he dropped it. "You are not supposed to drop it you're supposed to put it in your mouth."

The End


Still Smoking  by

Once upon a time, Cheech and Chong put gas in the truck. Chong lit a match and...Boom! They coughed. Chong went home to get clothes. Cheech came to Chong's house. Chong played his guitar real loud. And Italian guys hid in a car. A dog put his front legs over his ears. He went, "Owww!" Chong went into the house but couldn't get in. And he got in. He pulled the plug. And the guy goes, "I don't think that's gonna happen anymore." The End
The guy's name is Michael Knight. He fights and he has a neat car that can help him when he is in trouble. He has a watch he can talk into and the cars drives by itself. And it can go real, real fast. It can go faster than any other car. It has rocket boosters. He can jump over a truck. The bad guys cannot hurt him. The car can go up into the semi. That is the end of this story. The End.
The Elephant Had a Cold

One day Ben, the elephant, went outside and went to the park and went down the slide. At the end of the slide was a pool. And "splash"!

He got out and went to the other one. And at the end of that was the ocean. He splashed right into it. And that is how he got his cold.

The End
APPENDIX H

Sample Transcripts
February 4, 1986 - Language Experience - ML

Teacher: Ok. Read your story today and fill in the missing words with the word that would make sense that starts with that sound.

ML: The day at the the ss-school. The day at the zoo! One day me and my brother went to the Zoo. We sit -sat

Teacher: blank

ML: We blank the

Teacher: seals

ML: seals

Teacher: we

ML: I still don't know that word.

Teacher: We ss- the seals. We

ML: We saw the seals.

Teacher: Mm-hmm

ML: Then

Teacher: They

ML: They are n-nice, neat or nice, to water

Teacher: watch

ML: watch in water

Teacher: I think it's they are neat
Ml: neat to

Teacher: watch in water.

Ml: My brother was drawing the picture

Teacher: the animals

Ml: the animals. I saw a boy feed the

Teacher: feeding

Ml: feeding the animals.

Teacher: and

Ml: and he

Teacher: the

Ml: and the zookeep

Teacher: sign

Ml: the sign said: Do - do not feed the animals. But he obeyed

Together: disobeyed

Ml: the sign.

Teacher: rule

Ml: rule

Teacher: and
ML: and he fou

Teacher: was

ML: was going

Teacher: Oh, I'm sorry. And he fed

ML: I thought so.

Teacher: he

ML: felt the animal - he felt the animal

Teacher: no. He f-

ML: felt

Teacher: What was he doing that he shouldn't?

ML: feeling the animals - I don't know. Feed!

Teacher: Yes!

ML: He feed the animals.

Teacher: Did that make sense? He feed- feed the animals? He?

ML: fed

Teacher: fed

ML: the animals

Teacher: the animals.
Ml: But the zoo keeper

Teacher: the

Together: zoo manager

Ml: was going

Teacher: across

Ml: across the bridge and was

Teacher: saw

Ml: saw the - this boy feed- fed

Teacher: feeding

Ml: feeding the animals. The manager said: Please do not

Teacher: don't

Ml: Please don't feed the animals or you'll get in trouble. Do

Teacher: Don't

Ml: Don't you see the sign? The boy said: yes, I seen the - saw the

Teacher: see, I see

Ml: saw

Teacher: see
Ml: I see the?

Teacher: Yes, I see the sign!

Ml: Yes, I see the sign! said

Teacher: sign

Ml: sign and - the boy said: I - I thought - I thought the animals were starving so I thought-

Teacher: di-

Ml: didn't

Teacher: disobeyed

Ml: disobeyed the sign. The End.

Teacher: Hey, neat story! You did a good job of figuring out. You just have to remember

Ml: Go slow

Teacher: Well, and what makes sense, what makes sense.
Teacher: Ok, let's read Maurice has a cold.

Ch: Maurice has a cold. One day Maurice the moose said, I have a cold. My nose is walking.

Teacher: Ok, listen to me. This is what you do. You're reading so well but this is how you sound. I have a cold. My nose is walking. Do I sound like that when I read to you out of this book? How do I sound? I sound like. My nose is walking. I make it sound like when we talk. Can you, make it sound like when we talk?

Ch: yea.

Teacher: Try real hard this time. Why don't you start right here. Boris

Ch: Boris the bear said.

Together: You mean your nose is running.

Ch: No, said Maurice

Teacher: Maurice

Ch: Maurice. My nose is walking.

Teacher: Very good! You read that very good.

Ch: I only have a little cold.

Teacher: Good!

Ch: I have

Teacher: am getting
Ch: getting

Together: hungry. Alright, said Boris. But you have to stick out your tongue first. Your belly looks

Ch: hu-

Together: hungry. I will make you some hot soup. Put the

Ch: spoon in your mouth. Ha, ha. No, no, said Boris. It

Teacher: is getting

Ch: is getting dark. If you

Teacher: your

Ch: cold

Teacher: cold

Ch: is better in the morning I will fix you some

Teacher: fix you hot

Ch: hot

Together: soup

Ch: Uh-uh-uh-uh-uh! The end.

Teacher: Good reading.
Teacher: Ok, I want you read your story and I'm going to underline the words you know.

R: The elephant that that had a cold.

Teacher: No. That's not what it says. The

Together: elephant

R: had a cold.

Teacher: very good.

R: One day Ben the elephant went out-

Teacher: went outs-

K: i- side and went to the park. And w-

Teacher: mm-hmm

R: when

Teacher: went

R: went and

Teacher: went d-

R: down the slide. And - I mean

Teacher: A-

Together: -t
R: the end of the slide was a pool. And splash! He got out of

Teacher: and

R: and went to the other one. And at the end of that was the ocean. He splashed right in

Together: into

R: it. And at

Teacher: that

R: at was

Teacher: is

R: is how he got his cold. The End. Was I pretty good?

Teacher: Mm- What do you think? Count how many words you knew.
LIST OF REFERENCES


Hall, Mary Anne (1979). The language experience approach for teaching reading (2nd ed.). Delaware: ERIC Clearinghouse on Reading and Communication Skills.


