An Attempt to Develop Automatic Sequential Language Skills in Kindergarten Children

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AN ATTEMPT TO DEVELOP AUTOMATIC SEQUENTIAL LANGUAGE SKILLS IN KINDERGARTEN CHILDREN

A Thesis
Presented to
the Graduate Faculty
Central Washington State College

In Partial Fulfillment
of the Requirements for the Degree
Master of Education

by
Stanley Goodrich
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APPROVED FOR THE GRADUATE FACULTY

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# TABLE OF CONTENTS

## CHAPTER

<table>
<thead>
<tr>
<th>I. INTRODUCTION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of Study</td>
<td>1</td>
</tr>
<tr>
<td>The Problem</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. PROCEDURES</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects</td>
<td>10</td>
</tr>
<tr>
<td>Pretesting</td>
<td>10</td>
</tr>
<tr>
<td>The Instructional Program</td>
<td>11</td>
</tr>
<tr>
<td>Posttesting</td>
<td>12</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. RESULTS</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>IV. DISCUSSION</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>V. SUMMARY</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APPENDIX A</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APPENDIX B</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APPENDIX C</th>
<th>PAGE</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>APPENDIX D</th>
<th>PAGE</th>
</tr>
</thead>
</table>
CHAPTER I
INTRODUCTION

Osgood's model of language acquisition, upon which the Illinois Test of Psycholinguistic Abilities (Kirk and McCarthy, 1961) is based, presents two levels of language functioning that are modifiable through learning, the representational level and the automatic-sequential level. The representational level is the most complex. It is sometimes referred to as the level of comprehension or meaning. Understanding words and formulating thoughts take place at the representational level. The automatic-sequential level is sometimes considered the mechanical level of functioning. It refers to the non-meaningful, automatic, over-learned skills needed for handling language without conscious effort. Research has demonstrated that reading disability is more closely associated with deficits at the automatic-sequential rather than the representational level of functioning. (Kass, 1966, Bateman, 1963, Ragland, 1966, Bateman, 1967.)

The ITPA assesses automatic-sequential language skills by the use of three tests, Auditory-Vocal Automatic, Visual-Motor Sequencing and Auditory-Vocal Sequencing.
According to the authors, the auditory-vocal automatic skill "permits one to predict future linguistic events from past experience." They explain that in listening to speech, one develops an expectation for what will be said on the basis of what has been said. As this skill requires no conscious effort, it is referred to as "automatic" or "non-meaningful". The test requires the child to supply the final word of a statement, invariably a word requiring inflection; e.g. the examiner says, "This man likes to eat. Here he is ______." 

The purpose of the Visual-Motor Sequencing test is to assess a child's ability to reproduce a sequence of visual stimuli from memory. Chips containing pictures or geometric designs are placed in a certain sequence in a tray. The subject is allowed to observe the sequence for five seconds. The chips are then dumped out and the subject is required to duplicate the sequence.

The purpose of the Auditory-Vocal Sequencing test is to assess the child's ability to reproduce a sequence of auditory stimuli from memory. A digit repetition test is used.

Kass (1966) administered the ITPA (along with five other tests selected to measure automatic sequential language functioning) to 21 children of normal intelligence diagnosed as disabled in reading. Subjects demonstrated
deficits in seven of eight skills at the automatic-sequential level of usage while demonstrating deficits in only one of the six skills at the representational level.

When investigating reading achievement and language skills of partially seeing children, Bateman (1963) administered the ITPA and the Monro reading battery to 59 elementary school children. She reported to have found that high reading achievement was correlated positively with skills measured by the three ITPA tests at the automatic-sequential level.

Sutton (1963) administered the ITPA test Visual-Motor Sequencing along with five other tests of visual memory to two groups of retarded children. One group consisted of twelve children who scored above their mental age reading grade expectancy on the Gates Basic Reading Test. The other group consisted of twelve children who scored below their reading grade expectancy. The lower reading achievers scored lower on four of the six tests of visual memory, including the ITPA Visual-Motor Sequencing.

Ragland (1966) administered the ITPA to two groups of educable mentally retarded children of differing reading ability. One group was composed of fifteen subjects who were reading one or more years below their mental age equivalent. The other group consisted of fifteen subjects
who were reading no more than six months below mental age. "The retarded readers were significantly inferior to the non-retarded readers on Auditory-Vocal Automatic, the total automatic-sequential level and total language age."

These studies are highly consistent. They strongly suggest that reading disability is the result of deficits at the automatic-sequential, rather than the representational, level of functioning.

Many investigators report attempts to develop automatic-sequential language skills. Hermann (1965) administered three months of programmed instruction to one of three mentally retarded siblings. A fourth subject from another family was also trained. The training sessions stressed proper use of singular and plural nouns, correct verb tenses, proper use of conjunctions, prepositions, possessives and positive, comparative and superlative adjectives. Pre- and post-testing with the ITPA test Auditory-Vocal Automatic indicated that both children who received instruction made significant gains (about three years.)

Olson, Hahn and Hermann (1965) strengthened both representational and automatic-sequential language skills in a class of educable mentally retarded seven year olds. All subjects received two and one half hours of instruction each day, five days per week, for eight weeks. Each
of the nine psycholinguistic areas assessed by the ITPA were emphasized in rotating order. The total training period lasted nine weeks. Pre- and post-testing with the ITPA indicated 10.5 months growth at the representational level and 3.5 months growth at the automatic sequential level.

Hart (1965) matched nine pairs of cerebral palsied children as to CA, LA, and IQ. All children were severely retarded in language development. The experimental group received 45 minutes of special instruction each day aimed at developing both representational and automatic sequential language skills. Pre- and post-testing with the ITPA indicated that the experimental group made a total language gain of 12.3 months while the control group gained 1.1 months during the seven week training period. A t test indicated that this difference was significant beyond the .001 level.

Smith (1965) matched 16 pairs of educable mentally retarded children between seven and ten years of age as to CA and ITPA total language age. Subjects in the experimental group were taken out of their classroom and trained in groups of eight for three 45 minute periods weekly, covering a training period of 11 weeks. The program was general and developmental and aimed at increasing both automatic-sequential and representational language
skills. Pre- and post-testing with the ITPA indicated that the experimental group gained 6.75 months in total language age and the controls showed a loss of .44 months in total language age during the 33 session program. A t test indicated that this difference was significant at the .001 level.

Blue (1965) matched two groups of trainable retarded children ranging in age from eight to seventeen as to CA and total language age. The experimental subjects received three 45 minute periods of language instruction per week for eleven weeks. Pre- and post-testing with the ITPA suggested that the experimental group made greater total language gain than the control group, although the difference was not significant. The younger subjects used in the study demonstrated significantly greater gains than the older subjects. It was suggested that the younger the subject, the more positive may be the results obtained from language training. Unfortunately the Hart, Smith, and Blue studies reported only total ITPA language growth.

Altonen (1967) reported making considerable progress developing automatic sequential language skills with primary educable mentally retarded children. She stated that when children first entered her classroom they could not speak in sentences or repeat a series of three sounds, words, or numbers. A language program emphasizing such
skills was developed. Although no hard data was presented, she stated that the program was achieving success. At mid-year, children were able to repeat five or six sounds, follow lengthy directions, and were beginning to speak in sentences.

Using the ITPA as a model, Karnes has developed classroom language activities for small group instruction of pre-school children. These activities have been published in *Helping Young Children Develop Language Skills* (Council for Exceptional Children, 1968). Karnes reported that children involved in these language activities have generally made greater progress than a variety of control groups in a research project at the Institute for Research on Exceptional Children, University of Illinois.

Although most of the research cited above had been done with older exceptional children, the evidence suggested that automatic sequential language skills could be developed within a normal population of younger children. This study was an attempt to develop automatic sequential language skills in a normal population of kindergarten children using the activities suggested by the work of Karnes. (Appendix A.)

**Importance of Study**

It has been estimated that at least one out of every ten school children (Harris, 1963, Rabinovitch, 1959,
Hallgren, 1950) is unable to read at a level normally expected from measures of general intellectual ability. As our educational system is largely geared to learning through reading, such youngsters' school progress is greatly handicapped. These children are usually not referred for diagnostic services until they have experienced at least a year or two of reading failure. By this time children have often developed a distaste toward reading. Remediation, at least with traditional means, hasn't proved too successful. (Gillham, 1967, Glass, 1968, Gardner and Ransom, 1968.) Reading achievement has been found to correlate positively with automatic sequential language skills. If it could be demonstrated that such skills could be taught, utilizing small group instruction with a normal population of kindergarten children, hopefully it would lead to further research concerning the relationship between teaching these skills and reading achievement.

The Problem

The purpose of this study was to determine if a group of kindergarten children, after receiving instructional activities designed to develop automatic-sequential language skills, would differ from a matched control group not receiving such instruction. The design of the study called for the administration of the three ITPA subtests,
Visual-Motor Sequencing, Auditory-Vocal Sequencing, and Auditory-Vocal Automatic, to both groups prior to and following the program of instructional activities.

The study attempted to answer the following questions:

(1) Would the experimental group differ from the control group in mean gain on the Visual-Motor Sequencing test of the ITPA?

(2) Would the experimental group differ from the control group in mean gain on the Auditory-Vocal Sequencing test of the ITPA?

(3) Would the experimental group differ from the control group in mean gain on the Auditory-Vocal Automatic test of the ITPA?
CHAPTER II
PROCEDURES

Subjects
All subjects used in this study were kindergarten pupils attending Emert School, Omak, Washington, during the 1969-70 school year. It was decided by flip of coin to use the morning session as the experimental group. The afternoon session served as the control group.

There were 25 children enrolled in the morning kindergarten session when the study was initiated. Twenty-three of these children were between five and six years of age. These children were selected to be used as experimental subjects. At the time of pretesting with the ITPA, two children were absent and one refused to accompany the examiner to the testing room. Before the study was completed, two other children had moved. Thus the final number of experimental subjects was eighteen (nine boys and nine girls). The mean age for the experimental subjects was five years six months. (Appendix B.)

There were twenty-three children in the afternoon kindergarten session, twenty-two of whom were between the ages of five and six years. These children were selected
to be used as control subjects. One child was absent and one child refused to accompany the examiner to the testing room during pretesting with the ITPA. One child was absent during post-testing with the ITPA. Thus the final number of control subjects was nineteen (ten boys and nine girls). The mean age for the control subjects was five years six months. (Appendix C.)

**Pretesting**

To determine if the two groups were of equal mental ability, the teacher administered the Goodenough Harris Drawing Test and the Rutgers Drawing Test Form A to all subjects. These tests were selected because of administrative ease and because they are usually regarded as relatively free of cultural bias. The Goodenough Harris Drawing Test was administered on September 15, 1969. Testing was done by alphabetically dividing the children into groups of five or six. Test administration followed the procedures prescribed by Harris. (Harris, 1961, Chapter 2.) On September 16, 1969, the kindergarten teacher administered the Rutgers Drawing Test. Children were again divided into groups of five or six and tested following the procedures prescribed by Starr. (Starr, 1968, Chapter 2.) Children who were absent on either or both of these days were administered the Harris and/or the Rutgers on the
first day that they returned to school. The Harris and Rutgers were scored by the author.

The author administered the three ITPA subtests, Auditory-Vocal Automatic, Auditory-Vocal Sequencing and Visual-Motor Sequencing to all subjects on September 17 and 18, 1969. Testing was done individually. Testing procedures followed those prescribed by McCarthy and Kirk. (McCarthy and Kirk, 1961.) Results were scored by the author.

**The Instructional Program**

Children in the experimental group were alphabetically divided into four subgroups. The number of children in each subgroup varied from day to day, depending upon how many children were present. Each subgroup received daily instructional sessions utilizing activities designed to strengthen automatic sequential language skills. These daily sessions were approximately ten minutes each. Each experimental subject received approximately seven hours and 30 minutes of such instruction over a two and one half month period. Instruction was done by the kindergarten teacher. Activities were equally divided to emphasize auditory-vocal automatic, visual-motor sequencing and auditory-vocal sequencing skills.

Activities used to strengthen the auditory-vocal automatic skill emphasized having the children speak in
complete sentences. Some activities stressed the use of plurals or the use of tense; e.g. the teacher would say, "The boy will run to the store now. Yesterday he _____ to the store." The children were to fill in the proper tense. In other activities, the teacher would supply the initial sound of a word (e.g., a student's name) and the children were to complete it.

Activities used to strengthen the visual-motor sequencing skill emphasized the use of visual memory; e.g. having the children reproduce a sequence of physical activities demonstrated by a leader.

Activities used to strengthen the auditory-vocal sequencing skill emphasized the use of auditory memory; e.g. having the children repeat a sequence of events read to them in a story.

While one subgroup was receiving instruction, the other children were involved in other kindergarten activities. All children in the morning session received the instructional program although only the previously designated eighteen were considered experimental subjects.

Each day the children in the afternoon class were grouped in the same way. They received daily 10 minute sessions utilizing art, social studies, language and math activities over a two and one half month period. All children in the afternoon class received this program
but only the previously designated nineteen were considered control subjects. A schedule of these activities is given in Appendix D.

**Posttesting**

The instructional program was completed on December 3, 1969. The author administered the three ITPA tests individually to experimental and control subjects on December 4 and 5, 1969. Unfortunately many children were ill due to flu, chicken pox and mumps. The following week, December 11 and 12, 1969, the remaining subjects were posttested. The classroom teacher administered the Goodenough Harris Drawing Test to all children on December 8, 1969. She administered the Rutgers Drawing Test on December 9, 1969. Children who were absent on either or both of these days were administered the Harris and/or Rutgers the first day they returned. Results were scored by the author.

**Statistical Analysis**

To determine if the experimental and control groups differed in mental ability as reflected by the drawing tests, the following statistical analysis was performed. Mean scores were derived from pre- and posttesting results. The statistic $t$, with a level of significance set at .05, was employed to determine the significance of the differ-
ences in mean scores between the two groups.

To determine whether the instructional program resulted in greater gain for the experimental group in automatic-sequential language skills, the following statistical analysis was performed. Differences between pre- and posttesting raw scores were obtained for each child in each group on each of the three ITPA tests. Means of the D scores were determined. The statistic $t$ with the level of significance set at .05, was employed to determine the significance of the differences in mean D scores received by the experimental and control groups on the three tests.
CHAPTER III

RESULTS

The results received on the Rutgers Drawing Test are as follows. The experimental group received a mean raw score of 11.5 on the pretest and 14.2 on the posttest. The control group received a mean raw score of 11.6 on the pretest and 14.2 on the posttest. Differences in performance between the two groups were not found to be significant ($t = -0.66, p < .05$).

The results received on the Goodenough Harris Drawing Test are as follows. The experimental group received a mean raw score of 22.7 on the pretest and 27.8 on the posttest. The control group received a mean raw score of 23.6 on the pretest and 29.0 on the posttest. Differences in performance between the two groups were not found to be significant ($t = -0.36, p < .05$).

The results received on the ITPA test, Auditory-Vocal Automatic, are as follows. The experimental group achieved a mean raw score gain of 2.5 during the ten week period. The control group achieved a mean raw score gain of 2.2. The difference in amount of gain achieved by the experimental and control groups was not significant,
The results received on the ITPA test, Visual-Motor Sequencing are as follows. The experimental group achieved a mean raw score gain of 3.3. The control group achieved a mean raw score gain of 1.2. The greater amount of gain achieved by the experimental group was significant, \( t = 3.4, p < .05 \).

The results received on the ITPA test, Auditory-Vocal Sequencing are as follows. The experimental group achieved a mean raw score gain of 2.9. The control group achieved a mean raw score gain of 1.3. The greater amount of gain achieved by the experimental group was significant, \( t = 2.36, p > .05 \).
CHAPTER IV
DISCUSSION

The two groups did not differ in performance on either drawing test. This was true for the pretest and the posttest. This suggests that they were matched according to the mental abilities reflected by these instruments.

The two groups did not differ in amount of growth achieved in Auditory-Vocal Automatic. This test assesses a subject's repertoire of grammatical rules. Although it was designed to be "nonmeaningful", or automatic, validity studies suggest that it may assess a general linguistic factor and be more meaningful than intended. (McCarthy, Olson, 1964). There is no evidence from this study to support the efficacy of the activities designated to strengthen this skill.

The experimental subjects made significantly more gain than the controls in Visual-Motor Sequencing and Auditory-Vocal Sequencing. If raw scores were changed to their language age equivalents, the experimental group would show a gain of 14 months achieved in Visual-Motor Sequencing. The control group would show a gain of five
months. The experimental group would show a gain of ten months achieved in Auditory-Vocal Sequencing. The controls would show a gain of four months. It appears that these greater gains were a result of the activities included in the experimental program.

Both groups were taught by the same teacher, who was aware of the purpose of the study. Thus the possibility of the Hawthorn effect remains a major limitation. The experimental group attended school in the morning, the control group in the afternoon. It can be hypothesized that kindergarten age children learn more effectively in the morning. This is a further limitation of the study. Nevertheless, the author believes that the results of the study suggest that the skills of Visual-Motor Sequencing and Auditory-Vocal Sequencing can be developed by small group instruction at the kindergarten level. It would be interesting to expand the study using a number of teachers with alternating experimental and control groups.

One might expect that the gains in the two sequencing skills was primarily the result of their respective designated activities. However, the relevancy of the thirty activities to each of the three automatic sequential skills remains unknown. This again would suggest an expanded study with a number of teachers and kindergarten groups attempting to strengthen one skill at a time
using the appropriate activities.

One can only speculate how long the experimental subjects will retain their statistical superiority. It would be interesting to retest all subjects the following school year.

The experimental subjects cannot be assumed to have achieved a greater readiness to learn to read. It could be argued that the instructional activities only strengthened the subject's ability to meet the criteria of the tests. It will be interesting to see how all the subjects score on the school's standardized reading achievement tests at the end of first grade.

The author believes that the results of the study are encouraging in spite of the limitations in design. Further research on the development of automatic sequential language skills and the role they play in reading is recommended.
CHAPTER V

SUMMARY

The Illinois Test of Psycholinguistic Abilities (Kirk and McCarthy, 1961) assesses two levels of language functioning, the representational level and the automatic sequential level. Research studies had demonstrated that children who are disabled in reading do poorly on skills at the automatic sequential level. This study was an attempt to develop these skills utilizing small group instruction with a normal population of kindergarten children. The author believed that if this could be demonstrated, it would lead to further research on the relationship between the teaching of these skills and actual reading achievement.

Children from two different kindergarten classes in Omak, Washington, were used as subjects. Eighteen children from the morning class served as the experimental group. Nineteen children from the afternoon class served as controls. The two groups were matched as to age, number of each sex, scores received on the Goodenough Harris Drawing Test and the Rutgers Drawing Test.

The automatic sequential language skill for all
subjects was assessed with the three ITPA tests, Auditory-Vocal Sequencing, Visual-Motor Sequencing and Auditory-Vocal Automatic. Experimental subjects were divided into subgroups of between four and six and administered daily instructional sessions designed to strengthen automatic sequential language skills. These daily instructional sessions were approximately 10 minutes each, and extended over a ten week period. Activities were equally divided to stress auditory-vocal automatic, auditory-vocal sequencing and visual-motor sequencing skills. The activities used were adaptations of those suggested by Karnes. (1968). Control subjects were divided into similar subgroups and administered daily 10 minute sessions utilizing activities that were considered part of the regular Omak kindergarten curriculum. These sessions also extended over a ten week period. Following this training period, all subjects were again assessed with the previously mentioned instruments.

The experimental and control groups did not differ in amount of gain achieved on the Auditory-Vocal Automatic test during the ten week period. There was no evidence from this study to support the efficacy of the activities designated to develop this skill.

Gains achieved by the experimental group were significantly greater than gains achieved by the control group in Visual-Motor Sequencing and Auditory-Vocal
Sequencing. These greater gains were assumed to be attributable to the instructional program.

Both groups were taught by the same teacher, who was aware of the purpose of the study. Thus the possibility of the Hawthorne effect was a major limitation. Nevertheless, the author felt that the results were encouraging. Further study of the actual reading achievement of the subjects was planned.
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APPENDIX A

SCHEDULE OF INSTRUCTIONAL ACTIVITIES
USED TO STRENGTHEN LANGUAGE SKILLS

9/22 Where is the pencil? (Auditory-Vocal Automatic) A pencil was placed in relationship to the child. The teacher supplied a model which the child repeated; i.e., "The pencil is over your head." Developed question-answer session; i.e., "Where is the pencil?" "The pencil is over my head."

9/23 Animals we saw on the farm. (Auditory-Vocal Sequential) Using the sentence, "On our trip to the farm we saw . . . .", each child repeated the sentence and added a new animal.

9/24 Stick Patterns (Visual-Motor Sequential). The teacher created patterns with small colored sticks for the children to reproduce.

9/25 Classification (Auditory-Vocal Automatic). The children took turns naming all the farm animals they could think of using the sentence "________ is a farm animal."

9/26 Body Touch (Visual-Motor Sequential). Leader touched various parts of the body in a lengthening sequence. Children tried to remember the sequence so they could repeat in order with the leader.

9/29 Rhythms (Auditory-Vocal Sequential). Children repeated the rhythmic pattern of the leader by clapping.

9/30 Clues (Auditory-Vocal Automatic). The teacher gave clues and the first sound of the name of a student. The children guessed who the child was.

10/1 Straw and cut paper chains (Visual-Motor Sequential). Children made a chain from stringing straws and paper, following a teacher-made pattern.

10/2 Classification (Auditory-Vocal Automatic). Children took turns naming all the colors they could think of using the sentence "________ is a color;" i.e., "Red is a color. Blue is a color."
10/3 Memory game (Visual-Motor Sequential). Teacher put three pictures on the table. After the children had time to look at them they were turned over. The children tried to remember which picture was where.

10/6 Do and tell (Auditory-Vocal Sequential). The teacher gave a short series of directions. The child did the things and then told what he had done, in order.

10/7 Animals in the barn (Auditory-Vocal Sequential). Teacher made three or more sounds of animals in the barn. The children told the names of the animals in the order the sounds were given.

10/8 Rhymes (Auditory-Vocal Automatic). The teacher used a sentence using rhymes. The children supplied the rhyming word; i.e., "Find your nose, touch your ________ (toes)."

10/9 Do as leader does (Visual-Motor Sequential). Leader did a lengthening sequence of motions, adding a new one each time. Children repeated.

10/10 Making a grocery list (Auditory-Vocal Sequential). Various props, such as egg cartons and soup cans, were used to stimulate children to make a grocery list. With props removed, each child repeated the previous list and added a new item.

10/13 String Beads (Visual-Motor Sequential). The children strung beads according to a pattern made by the teacher.

10/15 Questions (Auditory-Vocal Automatic). The teacher asked various questions and helped the children to answer them in complete sentences. Tape recorder was used with this lesson.

10/16 Grocery store (Visual-Motor Sequential). The teacher put 2, 3, or 4 grocery items in a box. The children told what, and in what sequence, the items were placed in the box.

10/20 Flannel Board Patterns (Visual-Motor Sequential). The teacher placed a pattern of clothes on the clothes line on the flannel board. After the children had a chance to study them, they were removed and one child tried to reproduce the pattern from memory.
Nursery rhymes (Auditory-Vocal Sequential). The teacher repeated favorite nursery rhymes leaving out words here and there for the children to supply.

Classification (Auditory-Vocal Automatic). Children took turns naming all the fruits they could think of using the sentence "_______ is a fruit."


Tell a story (Auditory-Vocal Sequential). The teacher told a story. The children told the main events of the story in the order that they happened.

Touch (Visual-Motor Sequential). A child went and touched something and sat down. Next child went and touched what the first child touched and then touched something else, etc.

Counting (Auditory-Vocal Automatic). Children counted with leader to stress plural forms; i.e., one star, two stars, three stars, etc.

The Giant's Garden (Auditory-Vocal Sequential). Giant needs children to work in his garden. If they cannot repeat Giant's nonsense syllables, i.e., ro-dum-de, they must work in his garden.


Story Telling (Auditory-Vocal Automatic). A child manipulated felt board pictures and told what happened using complete sentences. Tape recorder was used for this exercise.

Play Store (Auditory-Vocal Sequential). Children have a play store. The first child asks for one item. The second child asks for the first item and another item. Both the storekeeper and the customer must remember and repeat what was asked for. When the storekeeper misses, another storekeeper is chosen.

Memory game (Visual-Motor Sequential). Two or more objects were placed in a pattern; the children studied the pattern and then closed eyes. The
pattern was changed and the children then tried to find what was wrong and change it back.

11/10 Learning plurals (Auditory-Vocal Automatic). The group made up sentences about one object, and then a sentence about two or more objects; i.e., "There is one ball in the box." "There are two balls in the room." "One foot is up." "Now both feet are down."

11/12 On the way to school (Auditory-Vocal Sequential). Using the sentence "On our way to school we saw . . .", each child repeated the sentence and added a new thing.

11/13 Changing tense (Auditory-Vocal Automatic). The teacher used sentences that changed tense of the verb. The child supplied the correct tense of the verb; i.e. "We will sing some songs later. Yesterday we ______ (sang) some songs."

11/14 Upset Fruit Basket (Auditory-Vocal Sequential). The children sat in a circle. The teacher assigned the names of a fruit to each child. The teacher then called out the names of two fruits. These fruits then changed places. When the teacher called "Upset the fruit basket" all children changed places.

11/17 Do as the leader does, (Visual-Motor Sequential). Leader did a lengthening sequence of motions, adding a new one each time. Children repeated.

11/18 Rhythms (Auditory-Vocal Sequential). Children repeated the rhythmic pattern of the leader by clapping.

11/19 Clues (Auditory-Vocal Automatic). Teacher gave the initial sound and clues of something in the room. The children told what it was.

11/20 Story (Auditory-Vocal Sequential). Using the flannel board, the teacher told a story. The children then told the sequence of the main events in the story.

11/21 One finger paint (Visual-Motor Sequential). Dipping one finger in the paint, the children copied designs made by the teacher.

11/24 Changing Tense (Auditory-Vocal Automatic). The teacher used sentences that changed tense of the
verb. The child supplied the correct tense of the verb; i.e., "The boy will run to the store now. Yesterday he _______ (ran) to the store."

11/25 Pack a suitcase for Thanksgiving trip (Auditory-Vocal Sequential). Each child remembered and repeated the previous items mentioned and added a new thing to be packed in the suitcase for the trip.

11/26 Prepare Thanksgiving Dinner (Auditory-Vocal Automatic) Each child told what was going to prepare for Thanksgiving dinner, using complete sentences. Teacher sometimes helped make it a sentence.

12/1 Stick Patterns (Visual-Motor Sequential). The teacher created patterns with small colored sticks for the children to reproduce.

12/2 Nursery Rhymes (Auditory-Vocal Sequential). The teacher repeated favorite nursery rhymes and songs leaving out words here and there for the children to supply.

12/3 Christmas List (Auditory-Vocal Automatic). Each child told what he wanted for Christmas, using a complete sentence. Then each child told what he was getting for his mother for Christmas, using a complete sentence.
APPENDIX B
### APPENDIX B

#### EXPERIMENTAL GROUP DATA

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**APPENDIX C**

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APPENDIX D

SCHEDULE OF ACTIVITIES USED WITH CONTROL GROUP

9/22 Teacher passed out pictures of a cow to each child. She then led a question and answer session about cows. What color are cows? What do we get from cows? etc. Following the discussion, the children colored the cows.

9/23 Teacher passed out pictures of a horse to each child. She led a discussion like above, and the children colored the picture.

9/24 Teacher passed out the Weekly Reader to the children. The teacher asked question about the pictures; i.e. Who is in the picture? What are they doing?, etc. Teacher gave additional information about the pictures that was provided in the teacher's guide. Activities on the back stressed 'over and under'. Using pictures, children were to tell what things were over and what things were under.

9/25 Children were introduced to easel painting with three colors. Children were allowed to experiment with this new media.

9/26 Teacher passed out pictures of two pigs. She led a question and answer session about pigs, as above. The children then colored the picture of the pigs.

9/29 The teacher instructed the children in how to pass and use scissors. She then passed out pictures of a barn dittoed onto red paper. The children cut out the barn and pasted it to a large sheet of green paper.

9/30 The children cut out the words "Farm" and "Animals" that had been dittoed on a piece of paper. They then pasted these on the paper with the barn. The teacher demonstrated and gave verbal directions.

10/1 Weekly Reader discussion, as above. Activities on the back stress 'top' and 'bottom'; i.e., there were pictures of a man, hat and shoes. Children were to tell what should be on the top and what should be on the bottom of the man.
The teacher led a brief review of the farm animals studies. She then passed out the pictures of the animals that the children colored. The children put the pictures in the order they wanted them and the teacher stapled them together.

The teacher directed the children's attention to the leaves falling from the trees outside. She asked the children to especially note the colors. She then directed the children to make their own fall pictures using these colors.

Children again painted at the easel. This time the teacher said that she would like some pictures and pretty designs. They again used three colors.

Teacher introduced weaving, using cut oil cloth mats. The teacher showed how it was done and helped each one get started.

Weekly Reader discussion, as above. Activities on the back stressed the geometric shapes, triangle and circle. Children found and colored all triangles one color, all circles another color.

Health—Each child was asked to tell what he liked for breakfast. The teacher then described several good breakfasts, using the foods the children liked.

The teacher passed out large sheets of dark construction paper and a piece of white chalk to each child. She then demonstrated several ways of using the chalk to make designs. Children then made their own pictures.

Discussion on winter preparation. Children and teacher watched the leaves falling outside the windows. This stimulated a discussion of activities needed in preparation for winter.

Weekly Reader discussion, as above. Activities on back stressed the geometric shapes triangle, circle, and square. Children circled items that contained these designs. Each box contained three figures made up of these shapes. Two of the figures were the same. Children were to find and circle the two figures that were the same.
10/16 Teacher showed a filmstrip on how various animals prepare for winter. Following the filmstrip, the teacher led a discussion of the filmstrip. What animals did we see? How did these animals prepare for winter?

10/20 Teacher led a discussion of the celebration of Halloween. Using crayons, children made Halloween pictures.

10/21 Children were asked to make animals with modeling clay. Teacher demonstrated various ways of using the clay for this purpose.

10/22 Weekly Reader discussion, as above. Activities on the back were to help children see similarities and differences. Children were to find and circle the two things in each box that were the same.

10/23 Children again worked with the weaving mats, while the teacher helped those having difficulty.

10/24 Teacher showed pictures of, and talked about, Jack-O-Lanterns. Each child was then given a piece of orange paper and crayons and asked to draw his own Jack-O-Lantern.

10/27 Teacher asked each child what they had for lunch. Then she asked each child what their favorite food was. Using the format: soup, sandwich, fruit, and milk, children planned a lunch.

10/28 Children saw special film on Alaska. This involved a bus trip to another school—a new experience for most of the children.

10/29 Weekly Reader discussion, as above. Activities on the back to help children see relationships. Children were to find the things that go together and circle them; i.e., chair, lamp, bed, whale.

10/30 Children reviewed all the characters and things associated with Halloween. Then the teacher passed out paper and asked the children to draw a Halloween picture including in their picture a ghost, a witch, and a Jack-O-Lantern.

11/3 Teacher introduced children to new media, finger painting. Showed how to mix paint and various ways
of making designs and pictures. Children were allowed to experiment.

11/5 Finger painting continued.

11/7 Weekly Reader discussion, as above. Activities on the back asked children to find the thing that had the same direction as the first picture in the row.

11/10 Teacher passed out colored construction paper and scissors to each child. The children cut the paper into pieces and pasted them onto another piece of paper making collages.

11/12 Weekly Reader discussion, as above. Activities on the back had children follow the path from left to right with their crayon.

11/13 Began math book. First section comparison of size. Children discovered the largest boy and largest girl and the largest person in the group. Then the children decided on the largest of several other things. Teacher passed out books and children drew a ring around the largest thing in each box.

11/14 Children built houses, boats, trains, etc., using large cardboard blocks and large blocks of wood.

11/17 Math book, page 2. Children discovered the smallest boy and the smallest girl in the group. Then the children decided on the smallest of several other things. Teacher passed out the books and children drew a ring around the smallest thing in each box.

11/18 Began talking about Thanksgiving. What we do on Thanksgiving, what we eat, etc. Teacher passed out a large picture of a turkey for the children to color.

11/19 Weekly Reader discussion, as above. Activities on the back were to help children complete patterns in a left-to-right progression. Given part of a pattern, the children were to complete it.

11/20 Math book, page 3. Children found the longest in each group of three things of various lengths. Then the teacher passed out books and children drew a ring around the longest thing in each box.
11/21 One finger paintings. Children were given paper and paint. They used one finger in the paint as a brush and made a picture or design.

11/24 With the help of pictures, the teacher told the story of the first Thanksgiving. Children were given opportunity to ask questions and make comments.

11/25 Math book, page 4. Children found the tallest boy and girl in the group. They then found the tallest block and the tallest doll. Teacher passed out books and children drew a ring around the tallest thing in each box.

11/26 No class, due to early dismissal for Thanksgiving.

12/1 Children began talking about Christmas. Teacher told the children about a few of the customs in other lands in relation to Santa. She put up a large picture of Santa. She then gave each child a smaller picture of Santa to color.

12/2 Math book, page 5. Teacher had three objects and a box. One object was just the right size for the box. Children found the one that fit. In their book they drew a ring around the one that was the right size in each box.

12/3 Weekly Reader discussion, as above. Activities on the back, children were to repeat a pattern and duplicate a pattern.