EFFECTS OF MUSIC TRAINING
ON AUDITORY DISCRIMINATION

A thesis submitted in partial satisfaction of the requirements for the degree of Master of Arts in
Elementary Education: Reading Improvement

by

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ABSTRACT

EFFECTS OF MUSIC TRAINING ON AUDITORY DISCRIMINATION

by

Deborah Lynn Johnson

Master of Arts in Elementary Education

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The purpose of this study was to investigate the effects of an organized music program, specifically the Yamaha Music Program, on auditory discrimination skills of kindergarten children.

A Pretest-Posttest Control Group design was employed. The study utilized fifty kindergarten children from Superior Street School located in the Los Angeles Unified School District. The subjects were randomly assigned to the control group and experimental group. Both groups were pretested on the: (1) Wepman Auditory Discrimination Test, (2) Auditory Reception Test, (3) Auditory Sequential Memory Test, (4) Auditory Closure Test, and (5) Sound Blending Test. The last four tests mentioned are subtests relating to auditory discrimination selected from the Illinois Test of Psycholinguistic Abilities.

The experimental group was exposed to eighteen organized Yamaha Music Lessons provided by a Yamaha Music representative. Each lesson took forty-five minutes and was presented twice a week to the experimental group. The experimental group was divided into two smaller groups according to their respective kindergarten teacher and parti-
icipated in such activities as art and physical education. No special treatment was supplied for the control group. At the conclusion of the experiment, the control group and experimental group were posttested on the same five auditory discrimination tests.

The $t$ test for uncorrelated data was applied to test hypotheses one through five. The $t$ test for correlated data was used to test hypotheses six through fifteen. Each hypothesis was treated independently.

The findings of the present study indicate that significant ($p < .05$) $t$ ratios were attained on only one pretest and posttest comparison for the experimental group on the Auditory Sequential Memory Test. There were no significant ratios attained on the posttest comparisons for the experimental and control groups. There were no significant $t$ ratios attained on the pretest and posttest comparisons for the control group. The significance revealed by the experimental group indicated that the exposure to the organized Yamaha Music Program improves kindergarten children's auditory sequential memory ability.
CHAPTER I

STATEMENT OF THE PROBLEM

The purpose of this study was to determine what effects the Yamaha Music Program had upon the auditory discrimination ability of kindergarten children. Auditory discrimination development is part of the growing interest found in reading readiness. Authorities have recently stated or implied the increasing importance for children to follow a reading readiness program before embarking upon the goal of reading. The Yamaha Music Program, now available to most Southern California schools, was used in this experimental design to investigate what effects it had upon the performance of kindergarten children in their auditory discrimination abilities.

Rationale for the Study

Many studies exist which demonstrate that readiness for reading and success in early reading are greatly improved by a prereading preparatory program. Reading readiness is a broad term which encompasses many areas and modalities. It is not only an important factor in the preparation for reading, but it is also highly significant in the early stages of word recognition. Chall points out the importance of phonics and its positive association with reading achievement. "Knowing the sound values of the letters and being able to hear similarities and differences in the spoken words before learning to read also
helps a child learn to read in the beginning stages."\(^1\) Hafner and Jolly support the importance of the auditory modality in beginning reading. "Deficiencies in any of the basic areas can interfere with progress in learning to read. Auditory-discrimination weaknesses impede the learning of phonics."\(^2\) Finally, George and Evelyn Spache most certainly imply the relevance of musical instruction upon auditory discrimination in the following excerpt taken from their book, Reading in the Elementary School:

Good auditory discrimination helps the beginner to match words he is learning with his previous auditory experiences with the same words. Thus auditory discrimination is highly important in the early stages of word recognition. \(...\) Poor auditory discrimination is most frequently related to musical abilities such as pitch discrimination, recognition of auditory rhythms and beat, discrimination of tonal quality, timbre, and loudness. \(...\) Children with weak auditory discrimination tend to be unskilled in several or most of these abilities rather than simply defective in one. Observing such children, the primary teacher notes that they seem to lack an alertness or awareness of the auditory characteristics of words. \(^3\)

Spache directly points out here that a correlation between a child's auditory discrimination abilities and musical awareness does exist.

The present study focused on the auditory discrimination abilities of kindergarten children who were trained in the Yamaha program. The prime concern was to determine what effects the musical training had upon the kindergarten children's auditory discrimination abilities.

**Significance of the Study**

Factors lending significance to the present study included the need to provide educators with: (1) empirical evidence in the form of objective data regarding the effects of an organized music training
program on the auditory discrimination abilities of kindergarten children; (2) empirical evidence as to whether kindergarten children make significant gains in auditory discrimination skills as a result of the musical training; (3) verification or nullification of assumptions and claims made in non-empirical investigations concerned with the improvement of auditory discrimination abilities derived from musical training; (4) a model describing the implementation of an organized music program incorporated in a kindergarten curriculum; and, (5) conclusions that either substantiate or negate the merits and practicality of adopting an organized music program within an elementary school or kindergarten curriculum for the purpose of improving auditory discrimination abilities.

**Definition of Terms**

The following definitions were adopted for the purpose of this study:

**Auditory Discrimination.** Hafner defines it as "the ability to hear likenesses and differences in speech sounds..."4

**Yamaha Music Program.** A program to instill ear training and music fundamentals in four through eight year old children. A more elaborate description is supplied in Chapter Three.

**Rhythm.** Rhythm is "movement or fluctuation marked by the regular recurrence or natural flow of related elements."5 Kindergarten children in this study demonstrated their knowledge of rhythm by such activities as clapping, walking, skipping and playing rhythmic instruments.
Melody. This is a rhythmic succession of musical tones as it is heard or appears horizontally on a staff. Kindergarten children in this study demonstrated their knowledge of melody by such activities as visual and auditory recognition of melodies and singing songs.

Harmony. Harmony is "the chordal (or vertical) structure of a musical composition." Kindergarten children in this study demonstrated their knowledge of harmony by such activities as singing pitches in chordal arrangements and auditorily identifying chords played on the piano.

Ear Training. This is a field of elementary instruction designed to teach the student to recognize the differences in pitches. Kindergarten children in this study demonstrated their knowledge of ear training by reacting to differences in pitches through physical movements.

Wepman Auditory Discrimination Test. A test designed to measure a child's ability to recognize the fine differences that exist between the phonemes used in English speech.

Research Question

The question asked in the present study was: Do kindergarten children show significant gains in auditory discrimination abilities after participating in an organized music program?

For clarification purposes, it is important to mention that throughout this thesis, auditory discrimination abilities are in reference to reading readiness skills. No reference to auditory discrimination skills in regards to music is intended.

Research Hypothesis

The intent of the study was to test and analyze the following null hypotheses:

Hypothesis 1: There will be no significant difference in the Wepman Auditory Discrimination posttest mean scores between the experimental and control groups.

Hypothesis 2: There will be no significant difference in the Auditory Reception posttest mean scores between the experimental and control groups.

Hypothesis 3: There will be no significant difference in the Auditory Sequential Memory posttest mean scores between the experimental and control groups.

Hypothesis 4: There will be no significant difference in the Auditory Closure posttest mean scores between the experimental and control groups.

Hypothesis 5: There will be no significant difference in the Sound Blending posttest mean scores between the experimental and control groups.
**Hypothesis 6:** There will be no significant difference in the Wepman Auditory Discrimination pretest and posttest mean scores for the experimental group.

**Hypothesis 7:** There will be no significant difference in the Auditory Reception pretest and posttest mean scores for the experimental group.

**Hypothesis 8:** There will be no significant difference in the Auditory Sequential Memory pretest and posttest mean scores for the experimental group.

**Hypothesis 9:** There will be no significant difference in the Auditory Closure pretest and posttest mean scores for the experimental group.

**Hypothesis 10:** There will be no significant difference in the Sound Blending pretest and posttest mean scores for the experimental group.

**Hypothesis 11:** There will be no significant difference in the Wepman Auditory Discrimination pretest and posttest mean scores for the control group.

**Hypothesis 12:** There will be no significant difference in the Auditory Reception pretest and posttest mean scores for the control group.

**Hypothesis 13:** There will be no significant difference in the Auditory Sequential Memory pretest and posttest mean scores for the control group.

**Hypothesis 14:** There will be no significant difference in the Auditory Closure pretest and posttest mean scores for the control group.

**Hypothesis 15:** There will be no significant difference in the Sound Blending pretest and posttest mean scores for the control group.
Limitations of the Study

The present study was limited by variables attributed to the two kindergarten teachers and the testers who administered the pre-tests and posttests. The average socio-economic area and the short duration of the study also indicate limitations. The days selected for posttesting are an added limitation due to the time of year and the preparations for a holiday. Therefore, this study is generalizable only to schools with similar populations and conditions.
CHAPTER II

REVIEW OF RELATED LITERATURE

The major purpose of the present study was to measure the effects of an organized music program on the auditory discrimination abilities of kindergarten children. There were no empirical studies found that dealt specifically with the auditory discrimination skills of kindergarten children as influenced by an organized music training program such as the Yamaha Music Program. This chapter, therefore, summarizes the literature pertaining to: (1) studies utilizing the Wepman Auditory Discrimination Test in the primary grades, (2) studies utilizing the Illinois Test of Psycholinguistic Abilities in the primary grades, and (3) studies of the effects of music on aspects of reading in the elementary grades.

**Studies Utilizing the Wepman Auditory Discrimination Test in the Primary Grades**

John Bernius conducted a study in 1973 on the effects of specific instruction in listening on the auditory attention of first graders. He defined auditory attention as that aspect of the preparatory phase of auditory perception wherein auditory stimuli are selected for the purpose of immediate feedback. He supports the theory that listening is an important mode of learning. One hundred seventy-seven first grade children were randomly assigned to four experimental group classes and four control group classes. The test instruments included
the Wepman Discrimination Test as well as the Peabody Picture Vocabulary Test, the Threshold Acuity Test and subtests from the Detroit Tests for Learning Aptitude. Subjects in the four experimental groups participated for six weeks in thirty minutes of specific listening activity a day. The experimenter found a tendency for better performance from the experimental group but there was no significant difference revealed by the t test.

Mattola (1970) employed a pretest-posttest control group design with kindergarteners to investigate the effectiveness of developing auditory discrimination skills through a series of twenty-four lessons and to determine what effect the lessons had on listening habits and attitudes. The lessons were prepared by Mattola and were given twice a week in a twelve week period. There were seven experimental groups and six control groups consisting of one hundred seventy-nine and one hundred seventy-six subjects respectively. The Wepman Auditory Discrimination Test, the Phonemes Test of the Murphy-Durrell Reading Readiness Analysis and a listening inventory developed by the investigator were used in the study. A t test revealed significance in favor of the experimental group on the posttest auditory discrimination mean scores and the Phonemes Test mean scores. Listening habits and attitudes were not affected by the sequentially planned auditory discrimination lessons. However, it was concluded that Mattola's lessons could develop auditory discrimination and phonemic ability in kindergarten children.

The Wepman Auditory Discrimination Test was used again with a group of kindergarteners in a study conducted by Jean Schmidt (1972). This study utilized two hundred twelve kindergarteners to determine
The effect of an Auditory Perceptual Training Program on auditory memory span, perception of auditory figure ground and auditory discrimination ability. The experimental and control groups were pre-tested and posttested by the same examiners on five auditory ability tests. A two-way analysis of covariance with multiple classifications was employed. No significant difference was found on four of the tests used, which were the: (1) Metraux Test of Auditory Memory, (2) Test of Competing Messages, (3) Goldman-Fristoe-Woodcock Tests of Auditory Discrimination in Quiet and in Noise. The only significant difference was attained on the Wepman Auditory Discrimination Test. The auditory perceptual training resulted in significant improvement in kindergartener's auditory discrimination abilities. It was also concluded from the Wepman Auditory Discrimination Test that females made significantly greater improvement than males in auditory discrimination ability.

**Studies Utilizing the Illinois Test of Psycholinguistic Abilities in the Primary Grades**

The purpose of the study by Perozzi (1969) was to determine the relationship between speech sound discrimination skills and language abilities of thirty kindergarten children. Two SSO tests and the Revised Edition of the ITPA were administered. The difference between the two speech sound discrimination tests was that one relied on nonsense syllables and the other relied on actual words. The Pearson-Product correlations between the two speech sound discrimination tests and each subtest and total score from the ITPA were positive. The high correlation, .873 (p < .01) between the two SSO tests indicated
that the tests measure the same skill. Perozzi found that:

With respect to the auditory-vocal subtests of the ITPA, significant correlations were obtained between the two SSD tests and two measures of expressive language, Verbal Expression (p < .01), and Grammatic Closure (p < .05). The significant correlations between the SSD tests and two ITPA subtests measuring expressive language skills and insignificant correlations between the two SSD tests and subtests measuring receptive and associative language skills indicated that the ability to discriminate among speech sounds is more closely related to speaking than to the understanding or association of linguistic expressions.

Macione (1969) sought to find what differences exist between disabled and non-disabled readers as measured by the Illinois Test of Psycholinguistic Abilities, what psycholinguistic abilities discriminated between disabled and non-disabled readers and what typical patterns of psycholinguistic functioning were predominant with the disabled readers. Two groups of second and third grade boys were matched with respect to age, sex, grade in school, scholastic aptitude and school attended. There were twenty-eight disabled readers and twenty-eight non-disabled readers. It was found that the disabled readers were inferior (p < .05) to the non-disabled readers as measured by the visual sequential memory test, grammatic closure test, visual closure test and sound blending test. It was summarized that the pattern of psycholinguistic functioning for the disabled reading group included higher functioning at the representational level than at the automatic level.

Hepburn's study (1969) was similar to Macione's in that it also compared differences in reading ability on the Illinois Test of Psycholinguistic Abilities. Hepburn's subjects consisted of one hundred third grade boys and girls. In addition to the ITPA, the Wechsler
Intelligence Scale for Children and the Gates Advanced Primary Reading Tests were used in the study. The Gates Reading Tests were used to assign subjects to the "high" reading group and to the "low" reading group. After the subjects were assigned to the two equal groups, the language skills of each group were compared in an analysis of covariance design. It was found that subjects from the low reading group differed significantly ($p < .05$) from the subjects in the high reading group on the visual-motor association subtest. The groups also differed somewhat on the auditory-vocal automatic and auditory vocal association subtests. It was then concluded that the three above mentioned tests may be more closely related to skill in reading than are the other subtests of the ITPA.

**Studies of the Effects of Music on Aspects of Reading in the Elementary Grades**

The following study to be reviewed pertains most relevantly to the primary investigation of this thesis. In 1973, Arthur Dawkins conducted an experiment with disadvantaged preschool students to find the effects of music and music instruction on auditory discrimination test scores. Three methods of tape recorded instruction were utilized. One method consisted of stories involving primarily one syllable words, music and actual singing participation. The second method consisted of stories with music but omitted the active participation of singing. The third method consisted only of stories. A fourth group of children formed the control groups which did not receive any specific treatment. One hundred sixteen subjects ages 4-0 to 5-11 from low income families were randomly assigned to one of the four groups. Training occurred
during nine consecutive school days. The results revealed that the two groups which included music achieved significantly higher on the Wepman Auditory Discrimination Test when compared to the control group. The second posttest administered one month after the conclusion of the training showed that all three treatment groups gained significantly when compared to the control group on the Wepman Auditory Discrimination Test.

Gesler (1958) designed a study to examine the relationship between pitch discrimination and phonic sensitivity in all first grade children enrolled in one school in Connecticut. An original pitch test was employed in the study after previously validating it with a pilot study group. It was found that the correlation coefficients for all children expressing the relationship between pitch discrimination and consonant perception was significant. Moreover, the correlation coefficients for boys illustrating the relationship between pitch discrimination and vowel perception, and pitch discrimination and consonant blend perception was also significant. The coefficients which showed the relationship between total phonics test scores and pitch test scores were significant but did not reveal a difference between the performance of boys and that of girls. Significance was also found on the correlation coefficients between pitch discrimination and mental age.

Nellie Maze (1967) suggested the possibility of common factors between musicality ability and reading achievement. She limited the term musicality to include pitch and timbre discrimination, rhythm sense and tonal memory. A modified form of the Seashore Measures of Musical Talents and the Metropolitan Achievement Battery were adminis-
tered to one hundred twenty-four first graders. Significance \((p < .01)\) was found on the correlations between many subtests of musicality and reading achievement. The investigator noted that the most outstanding relationship appeared when reading achievement and correspondingly high musicality profiles were examined in terms of sex differences. Maze found that boys showed much higher levels of significance in this area of reading achievement and musicality than did girls.

Graham (1965) pointed out the importance of listening skills and the lack of research in the area of listening. The study he conducted involved thirteen classrooms of fourth and fifth grade students. The subjects were randomly assigned to the experimental and control groups. The Hollow Test of Listening Comprehension was used as a pretest and posttest and was administered to both groups. Tape recorded lessons in listening which employed music as the medium of performance were presented to the experimental group. Subjects in the experimental group gained significantly \((p < .05)\) in their ability to listen as revealed by an analysis of covariance. It was concluded that a systematically developed program of listening instruction can effectively improve listening skills of the children involved.

Yamaha International Corporation examined the results of three different tests administered by the Downey Unified School District during 1971. Their purpose was to determine if children who had a background of Yamaha Music School training possessed educational advantages over children who had not received YMS training. Eighteen schools participated in the study. From these schools, sixty-six Yamaha and sixty-six non-Yamaha students were matched. Each were matched with equal mental age and chronological age prior to any
Yamaha training. These children had the same: (1) teachers, (2) schools, and (3) classes. They were given these three tests: (1) Star Test - to establish the children's mental age in relation to their chronological age, (2) Metropolitan Test - to determine various strengths and weaknesses in the areas of reading readiness and comprehension for each child, and (3) Cooperative Primary Test Reading Form #12 - designed to measure the grade level of a child's reading ability. The first two tests were administered during the children's kindergarten year. The third test was given when the children were in first grade. The Yamaha Corporation (1971) published the following results:

Under the conditions established in the Star Test, the following results were compiled:

1. Non-Yamaha students, on the average, scored in the 61st percentile in the National Percentile Ranking.

2. Yamaha students, on the average, scored in the 77th percentile in the National Percentile Ranking.

3. No explanation given for the omission.

4. The average RAW score of Yamaha students was 67. While the average RAW score of non-Yamaha students was 60.

(The results of the Cooperative Primary Test - Reading Form #12 were:

1. The average first grade child at Downey Unified School District preparing to enter second grade has a reading grade level of 1.5 (5 months into first grade).

2. Average first grade children with one year of Yamaha training had reading grade level of 2.4

3. Average first grade children with two years of Yamaha train-
ing had a reading grade level of 2.8 (almost third grade).

4. Some Yamaha children scored as high as 4th and 5th grade levels.

The Yamaha Corporation concluded that this survey indicates that music does have a definite positive influence on a child's reading ability and other areas of learning.

The facts previously presented were obtained through the Yamaha company. The survey does seem to indicate positive results for the benefit of music in regards to its value in education. However, one might wish to ponder the actual significance of the survey. This is the only study or report of any kind dealing with Yamaha to be found to this date.

Consequently, the present study was designed to provide empirical evidence regarding the effects of an organized music program on the auditory discrimination skills of kindergarten children.
CHAPTER III

RESEARCH DESIGN AND PROCEDURES

The purpose of the present study was to measure what effects the Yamaha Music Program had on kindergarten children's auditory discrimination abilities.

This chapter describes: (1) the selection of the sample; (2) the research design; (3) the instruments and procedures utilized to collect the data; (4) the statistical treatments employed to analyze the data; and, (5) the Yamaha Music training procedures.

Sample Selection

Two kindergarten teachers from Superior Street Elementary School in Chatsworth, California were asked for their cooperation and permission for their students to participate in the study. All kindergarten children from these two classes were randomly assigned to the control or experimental group. Each group had twenty-five subjects. All subjects were administered five auditory discrimination pretests. The experimental group was divided into two smaller groups. Each group of subjects had the same kindergarten teacher. The experimental group participated in eighteen organized music lessons. The lessons were given twice a week for forty-five minutes each by the same Yamaha music teacher. The control group participated in art, music and physical education activities during this period with their respective
kindergarten teacher. At the end of the nine weeks, all kindergarten subjects from both groups were administered the same five auditory discrimination posttests. A few subjects were lost from both groups.

**Design**

The design was composed of two groups. The design took the form of a pretest-posttest with a control group. The experimental group was divided into two smaller groups only for the purposes of Yamaha musical instruction. The subjects in the control group were merely pretested and posttested. The organization of the experimental treatments are presented in Illustration 1.

**Illustration 1**

*Pretest-Posttest Control Group Design*

| Weeks 1-9 |  
|---|---|
|  
|  
|  
|  
| $O_1$ | $X$ | $O_2$ (Experimental Group) |
| $O_1$ |  | $O_2$ (Control Group) |

Where: $O$ indicated the administration of auditory discrimination tests.

$X$ indicates the administration of the Yamaha Music Program.

**Research Instruments**

The Wepman Auditory Discrimination Test and four selected ITPA
auditory discrimination tests were used for the pretests and posttests. The pretest was administered to check the randomization of the two groups. It was also used to assess the achievement gained by both groups. The four subtests used from the Illinois Test of Psycholinguistic Abilities were: (1) Auditory Reception, (2) Auditory Sequential Memory, (3) Auditory Closure, and (4) Sound Blending. The same pretests were used as posttests to assess the achievement gains made by each group and to assess the mean scores among the experimental group and the control group.

The Wepman Auditory Discrimination Test and the four subtests of the ITPA were selected by the investigator on the basis of: (1) relevancy to the problem under investigation, (2) appropriate subtests, (3) availability, and (4) the hypothesis tested.

The Auditory Discrimination Test by Wepman directly applied to this study for it was designed to test the ability to recognize fine differences that exist between phonemes used in English speech. It was geared for children in the early elementary school years. The child is presented with no visual stimuli and is only required to indicate affirmatively or negatively by saying a single word or merely nodding and shaking the head as needed. Every possible match of phonemes was used within the phonetic categories. The word pairs selected were matched for familiarity by selecting words as closely together as possible from the Lorge-Thorndike Teacher's Word Book of 30,000 words.

The four subtests selected from the ITPA were all connected with the auditory modality. Only one test was used that required any
type of visual stimuli. Auditory Reception is a test intended to
assess the ability of a child to derive meaning from verbally present-
ed material. The response required is kept at the level of a simple
"yes" or "no" or shake of the head. The Auditory Sequential Memory
Test assesses a child's ability to reproduce verbally from memory,
sequences of digits increasing in length from two to eight digits.
The digits are presented at the rate of two per second and the child
is allowed a second trial for each sequence if he fails on the first
presentation. However, the child receives more credit for success on
the first trial than on the second trial. The Auditory Closure Test
assesses the child's ability to fill in missing parts which were de-
leted in auditory presentation and to produce a complete word. Audit-
ory closure is an automatic function which occurs in everyday life.
Sound Blending is also a type of closure process at the automatic
level. The Sound Blending Test assesses the child's ability to syn-
thesize separate word parts and produce an integrated whole. The
sounds of a word are spoken singly at half-second intervals. The
child must tell what the word is. It is in this test, only, that
visual stimuli is used. For the first eight word parts presented, the
child has pictures to assist him in decoding the word. The rest of the
test is purely auditory. The latter part of the Sound Blending Test
includes nonsense words. All of the tests used in the study rely on
the child's ability to listen and discriminate auditorily. All tests
were administered individually to each child.
Data Collection

The pretests were administered to all subjects during the fourth week of September and first week of October, 1973. The post-tests were given at the conclusion of the nine-week music program, during the second and third week of December, 1973. The investigator trained six college seniors from a Reading Methods course at California State University Northridge to administer all pretests and post-tests. The investigator supervised during the testing sessions. The resulting data were scored, analyzed and interpreted by the investigator.

Statistical Analysis

The $t$ test for uncorrelated data was applied to hypotheses one through five. The $t$ test for correlated data was used for hypotheses six through fifteen. In each instance, the level of significance necessary to reject the null hypotheses was set at the .05 level. When a $t$ score was non-significant, the null hypothesis was not rejected.

Yamaha Music Training Program

The present study focused on the effect of the Yamaha Music program on kindergarten children's auditory discrimination abilities. The kindergarten children in the experimental group were divided according to their respective kindergarten teachers into two groups. The experimental groups attended eighteen forty-five minute organized music lessons presented by a Yamaha Music Representative.
The lessons took place during the morning school time and occurred twice a week. The investigator observed sections of the lessons each day. Each class session was comprised of activities in areas such as: (1) ear training, (2) learning the basic principles of rhythm, (3) learning the basic principles of melody, (4) learning the basic principles of harmony, (5) keyboard playing, and (6) ensemble participation.

Ear training encompassed many varied activities. The children were asked to distinguish high, middle and low pitches played by the piano by reacting with body movements. Different chords were played on the piano during which the subjects were trained to recognize and distinguish. The subjects responded to loud and soft dynamics with arm and hand movements. Fast and slow tempos were also reacted to by the subjects with body motions. The "Copy Cat" song was used to train the children to recognize notes, different pitches and melodic movement. The Music Teacher would sing the "Copy Cat" song and the children would imitate her during particular intervals throughout the song. The children were trained to recognize and identify songs by ear.

Learning basic principles of rhythm was accomplished by the subjects imitating rhythms by clapping. The subjects moved to different rhythms played on the piano. Speech rhythm is a term used to mean clapping to the syllables of words. "Train is a-coming" is a song used in which notes and their values were discussed. Children would make their own rhythm and clap them. Note reading was presented. However, it must be noted that any visual stimuli was employed only as a reinforcement of auditorily presented material.

Learning the basic principles of melody was accomplished by the
memorization of songs. Children were taught particular songs that exposed them to the scale and recurring melodic lines. "Hot Cross Buns" and "The Wind Song" were used for these purposes. The subjects also reacted to the musical signals indicated by a melodic line presented on the piano. For example, "Come to the piano please" was a musical signal. It was a simple melodic line without vocal instructions.

Learning the basic principles of harmony was accomplished through the presentation of different chords. The subjects were required to identify the chord and the notes in the chord. Major and minor chords were also presented and discussed. Children would listen to a song played in a major (happy) key and a minor (sad) key and asked their impressions of the song.

Keyboard playing consisted of the subjects finding particular notes on the keyboard and playing them. The subjects also played series of one note melodies. Due to the time factor, very little keyboard playing occurred during the music sessions.

Ensemble participation means that the subjects would sing songs and play rhythm instruments together. Randomly appointed children would lead the rest of the group with dynamic conducting or by selecting particular rhythm groups to play at certain intervals.

All of the above mentioned areas were presented in an organized fashion at each of the eighteen sessions. The music training sessions centered primarily on the auditory improvement of the subjects in regards to music. Listening was the key to correct responses.
Yamaha Music Training Schedule

Eighteen, forty-five minute music sessions were presented to two experimental groups. The organization of the music sessions are presented in Illustration 2.

<table>
<thead>
<tr>
<th></th>
<th>Tuesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:15 -</td>
<td>Experimental Group I</td>
<td>Experimental Group II</td>
</tr>
<tr>
<td>10:00</td>
<td>Experimental Group II</td>
<td>Experimental Group I</td>
</tr>
</tbody>
</table>

Note that the groups participated in the Yamaha music lessons at different times to avoid one group having an advantage over the other group due to a better time during the morning.
CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

This chapter presents the data and analyzes the results of the study.

Treatment of the Data

The $t$ test for uncorrelated data was applied to test hypotheses one through five. The $t$ test for correlated data was used for hypotheses six through fifteen. In each instance the level of significance necessary to reject the null hypotheses was set at the .05 level. Each hypothesis was treated independently. Hypotheses one through five compared the experimental group with the control group on the five posttests. Hypotheses six through ten dealt with pretest-posttest comparisons for the experimental group. Hypotheses eleven through fifteen dealt with pretest-posttest comparisons for the control group. When the $t$ ratio was found to be significant for a given hypothesis, the null hypothesis was rejected. When the $t$ ratio was not significant, the null hypothesis was not rejected. An abbreviated n.s. was used to indicate non-significance.
Presentation of the Data

Hypothesis No. 1

The null hypothesis stated that there would be no significant difference in the Wepman Auditory Discrimination posttest mean scores between the experimental and control groups. The statistical data in Table 1 show the results of the t-test.

### TABLE 1

THE POSTTEST SUMMARY TABLE ON THE WEPMAN AUDITORY DISCRIMINATION TEST (N = 47)

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>23</td>
<td>26.22</td>
<td>8.48</td>
<td>1.77</td>
<td>45</td>
<td>.135 (n.s.)</td>
</tr>
<tr>
<td>Control</td>
<td>24</td>
<td>25.88</td>
<td>8.89</td>
<td>1.81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was not a significant difference between the experimental and control groups posttest mean scores as measured by the Wepman Auditory Discrimination Test. Therefore, the null hypothesis was not rejected.
Hypothesis No. 2

The null hypothesis stated that there would be no significant difference in the Auditory Reception posttest mean scores between the experimental and control groups. The statistical data in Table 2 show the results of the t-test.

**TABLE 2**

THE POSTTEST SUMMARY TABLE ON THE AUDITORY RECEPTION TEST

(\(N = 43\))

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>21</td>
<td>22.33</td>
<td>7.09</td>
<td>1.55</td>
<td>41</td>
<td>1.254 (n.s.)</td>
</tr>
<tr>
<td>Control</td>
<td>22</td>
<td>25.46</td>
<td>9.06</td>
<td>1.93</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was not a significant difference between the experimental and control groups posttest mean scores as measured by the Auditory Reception Test. Consequently, the null hypothesis was not rejected.
Hypothesis No. 3

The null hypothesis stated that there would be no significant difference in the Auditory Sequential Memory posttest mean scores between the experimental and control groups. The statistical data in Table 3 show the results of the t test.

**TABLE 3**

THE POSTTEST SUMMARY TABLE ON THE AUDITORY SEQUENTIAL MEMORY TEST (N = 45)

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>23</td>
<td>10.87</td>
<td>4.27</td>
<td>.89</td>
<td>43</td>
<td>.321</td>
</tr>
<tr>
<td>Control</td>
<td>22</td>
<td>11.27</td>
<td>4.14</td>
<td>.88</td>
<td></td>
<td>(n.s.)</td>
</tr>
</tbody>
</table>

There was not a significant difference between the experimental and control groups posttest mean scores as measured by the Auditory Sequential Memory Test. Hence, the null hypothesis was not rejected.
Hypothesis No. 4

The null hypothesis stated that there would be no significant difference in the Auditory Closure posttest mean scores between the experimental and control groups. The statistical data in Table 4 show the results of the t-test.

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>23</td>
<td>16.83</td>
<td>7.06</td>
<td>1.47</td>
<td>43</td>
<td>.400 (n.s.)</td>
</tr>
<tr>
<td>Control</td>
<td>22</td>
<td>17.23</td>
<td>6.94</td>
<td>1.48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was not a significant difference between the experimental and control groups posttest mean scores as measured by the Auditory Closure Test. Therefore, the null hypothesis was not rejected.
Hypothesis No. 5

The null hypothesis stated that there would be no significant difference in the Sound Blending posttest mean scores between the experimental and control groups. The statistical data in Table 5 show the results of the t test.

**TABLE 5**

**THE POSTTEST SUMMARY TABLE ON THE SOUND BLENDING TEST**

(N = 43)

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>21</td>
<td>12.14</td>
<td>4.44</td>
<td>.97</td>
<td>41</td>
<td>.519</td>
</tr>
<tr>
<td>Control</td>
<td>22</td>
<td>12.95</td>
<td>5.71</td>
<td>1.22</td>
<td></td>
<td>(n.s)</td>
</tr>
</tbody>
</table>

There was not a significant difference between the experimental and control groups posttest mean scores as measured by the Sound Blending Test. Therefore, the null hypothesis was not rejected.
Hypothesis No. 6

The null hypothesis stated that there would be no significant difference in the Wepman Auditory Discrimination pretest and posttest mean scores for the experimental group. The statistical data in Table 6 show the results of the t test.

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>23</td>
<td>24.57</td>
<td>9.03</td>
<td>1.88</td>
<td>44</td>
<td>.639</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>23</td>
<td>26.22</td>
<td>8.48</td>
<td>1.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Wepman Auditory Discrimination pretest-posttest mean scores for the experimental group. Consequently, the null hypothesis was not rejected.
Hypothesis No. 7

The null hypothesis stated that there would be no significant difference in the Auditory Reception pretest-posttest mean scores for the experimental group. The statistical data in Table 7 show the results of the t test.

### Table 7

**The Experimental Group Summary Table on the Auditory Reception Test (N = 42)**

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>21</td>
<td>21.05</td>
<td>8.16</td>
<td>1.78</td>
<td>40</td>
<td>.545</td>
</tr>
<tr>
<td>Posttest</td>
<td>21</td>
<td>22.33</td>
<td>7.09</td>
<td>1.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Auditory Reception pretest-posttest mean scores for the experimental group. Hence, the null hypothesis was not rejected.
Hypothesis No. 8

The null hypothesis stated that there would be no significant difference in the Auditory Sequential Memory pretest-posttest mean scores for the experimental group. The statistical data in Table 8 show the results of the t test.

TABLE 8
THE EXPERIMENTAL GROUP SUMMARY TABLE ON THE AUDITORY SEQUENTIAL MEMORY TEST (N = 46)

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>23</td>
<td>8.52</td>
<td>3.49</td>
<td>.73</td>
<td>44</td>
<td>2.043*</td>
</tr>
<tr>
<td>Posttest</td>
<td>23</td>
<td>10.87</td>
<td>4.20</td>
<td>.89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

There was a significant difference in the Auditory Sequential Memory pretest-posttest mean scores for the experimental group. Therefore, Hypothesis No. 8 was rejected beyond the .05 level of significance.
Hypothesis No. 9

The null hypothesis stated that there would be no significant difference in the Auditory Closure pretest-posttest mean scores for the experimental group. The statistical data in Table 9 show the results of the $t$ test.

**TABLE 9**

THE EXPERIMENTAL GROUP SUMMARY TABLE ON THE AUDITORY CLOSURE TEST (N = 46.)

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>23</td>
<td>14.04</td>
<td>5.85</td>
<td>1.22</td>
<td>44</td>
<td>1.422</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>23</td>
<td>16.83</td>
<td>7.34</td>
<td>1.53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Auditory Closure pretest-posttest mean scores for the experimental group. Consequently, the null hypothesis was not rejected.
Hypothesis No. 10

The null hypothesis stated that there would be no significant difference in the Sound Blending pretest-posttest mean scores for the experimental group. The statistical data in Table 10 show the results of the \( t \) test.

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>21</td>
<td>10.33</td>
<td>5.34</td>
<td>1.17</td>
<td>40</td>
<td>.886</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>21</td>
<td>11.76</td>
<td>5.11</td>
<td>1.12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Sound Blending pretest-posttest mean scores for the experimental group. Therefore, the null hypothesis was not rejected.
Hypothesis No. 11

The null hypothesis stated that there would be no significant difference in the Wepman Auditory Discrimination pretest-posttest mean scores for the control group. The statistical data in Table 11 show the results of the t test.

TABLE 11
THE CONTROL GROUP SUMMARY TABLE ON THE WEPMAN AUDITORY DISCRIMINATION TEST ( N = 48 )

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>24</td>
<td>24.50</td>
<td>7.47</td>
<td>1.53</td>
<td>46</td>
<td>.580 (n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>24</td>
<td>25.88</td>
<td>8.89</td>
<td>1.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Wepman Auditory Discrimination pretest-posttest mean scores for the control group. Therefore, the null hypothesis was not rejected.
Hypothesis No. 12

The null hypothesis stated that there would be no significant difference in the Auditory Reception pretest-posttest mean scores for the control group. The statistical data in Table 12 show the results of the t test.

### TABLE 12

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>22</td>
<td>21.00</td>
<td>7.31</td>
<td>1.56</td>
<td>42</td>
<td>1.593</td>
</tr>
<tr>
<td>Posttest</td>
<td>22</td>
<td>25.00</td>
<td>9.23</td>
<td>1.97</td>
<td></td>
<td>(n.s.)</td>
</tr>
</tbody>
</table>

There was no significant difference found in the Auditory Reception pretest-posttest mean scores for the control group. Hence, the null hypothesis was not rejected.
Hypothesis No. 13

The null hypothesis stated that there would be no significant difference in the Auditory Sequential Memory pretest-posttest mean scores for the control group. The statistical data in Table 13 show the results of the t-test.

TABLE 13
THE CONTROL GROUP SUMMARY TABLE ON THE AUDITORY SEQUENTIAL MEMORY TEST ( N = 44 )

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>22</td>
<td>10.73</td>
<td>4.79</td>
<td>1.02</td>
<td>42</td>
<td>.404</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>22</td>
<td>11.28</td>
<td>4.14</td>
<td>.88</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Auditory Sequential Memory pretest-posttest mean scores for the control group. Therefore, the null hypothesis was not rejected.
Hypothesis No. 14

The null hypothesis stated that there would be no significant difference in the Auditory Closure pretest-posttest mean scores for the control group. The statistical data in Table 14 show the results of the t test.

TABLE 14

THE CONTROL GROUP SUMMARY TABLE ON THE AUDITORY CLOSURE TEST
(\( N = 44 \) )

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>22</td>
<td>14.32</td>
<td>5.92</td>
<td>1.26</td>
<td>42</td>
<td>1.495 (n.s.)</td>
</tr>
<tr>
<td>Posttest</td>
<td>22</td>
<td>17.23</td>
<td>6.94</td>
<td>1.48</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Auditory Closure pretest-posttest mean scores for the control group. Hence, the null hypothesis was not rejected.
Hypothesis No. 15

The null hypothesis stated that there would be no significant difference in the Sound Blending pretest-posttest mean scores for the control group. The statistical data in Table 15 show the results of the t test.

<table>
<thead>
<tr>
<th>Source</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Standard Error</th>
<th>df</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>22</td>
<td>11.82</td>
<td>6.84</td>
<td>1.46</td>
<td>42</td>
<td>.805</td>
</tr>
<tr>
<td>Posttest</td>
<td>22</td>
<td>13.41</td>
<td>6.25</td>
<td>1.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no significant difference found in the Sound Blending pretest-posttest mean scores for the control group. Therefore, the null hypothesis was not rejected.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study investigated the effects of the Yamaha Music Program on the auditory discrimination abilities of Kindergarten children.

The significance of the present study was based on the premise that kindergarten students who received the organized music instruction would significantly improve their mean scores on the: (1) Wepman Auditory Discrimination Test, (2) Auditory Reception Test, (3) Auditory Sequential Memory Test, (4) Auditory Closure Test, and (5) Sound Blending Test. The basic assumptions were that the kindergarten children who received the Yamaha music instruction would make significant gains on the posttest mean scores when compared to; (1) the control group posttest mean scores, and (2) the experimental group pretest mean scores. Factors which lent significance to the study included the need: (1) to provide empirical evidence regarding the auditory discrimination achievement of kindergarten children who were exposed to the Yamaha Music Program; (2) to verify or challenge claims made in empirical or non-empirical investigations concerned with the improvement of auditory discrimination abilities derived from musical training; (3) to provide a model describing the implementation of an organized music program incorporated in a kindergarten curriculum;
and (4) to provide conclusions that either substantiate or negate the feasibility of implementing an organized music program within an elementary school curriculum for the purposes of improving auditory discrimination abilities.

The subjects were fifty kindergarten children belonging to two kindergarten teachers at one elementary school. The sample was assigned by randomization to the control and experimental groups. A Pretest-Posttest Control Group Design was employed.

The Wepman Auditory Discrimination Test and four subtests from the Illinois Test of Psycholinguistic Abilities were used to measure the auditory discrimination achievement of the kindergarten children. The pretests were administered during the fourth week in September and first week in October, 1973. The posttests were given at the conclusion of the nine-week music program, during the second and third week of December, 1973.

Following the pretests, the experimental group received eighteen, forty-five minute music lessons. The subjects assigned to the Control Group were merely pretested and posttested.

The t test for uncorrelated data was applied to test hypotheses one through five. The t test for uncorrelated data was used for hypotheses six through fifteen. In each case, the level of significance necessary to reject the null hypothesis was set at the .05 level. Each hypothesis was treated independently.

Null Hypothesis No. 1 was not rejected. There was no significant difference in the Wepman Auditory Discrimination posttest mean scores between the experimental and control groups. The kindergarten children that participated in the Yamaha Music Program did not
outperform the control subjects.

Null Hypothesis No. 2 was not rejected. There was no significant difference in the Auditory Reception posttest mean scores between the experimental and control groups. The subjects that participated in the Music Program did not outperform the control subjects.

Null Hypothesis No. 3 was not rejected. There was no significant difference in the Auditory Sequential Memory posttest mean scores between the experimental and control groups. The experimental subjects that participated in the Music Program did not outperform the control subjects.

Null Hypothesis No. 4 was not rejected. There was no significant difference in the Auditory Closure posttest mean scores between the experimental and control groups. The experimental subjects that participated in the Music Program did not outperform the control subjects.

Null Hypothesis No. 5 was not rejected. There was no significant difference in the Sound Blending posttest mean scores between the experimental and control groups. The experimental subjects that participated in the Music Program did not outperform the control subjects.

Null Hypothesis No. 6 was not rejected. There was no significant difference in the Wepman Auditory Discrimination pretest-posttest mean scores for the experimental group. The kindergarten children that participated in the Yamaha Music Program did not make gains on the Wepman Auditory Discrimination Test.

Null Hypothesis No. 7 was not rejected. There was no
significant difference in the Auditory Reception pretest-posttest mean scores for the experimental group. The kindergarten children that participated in the Yamaha Music Program did not make significant gains on the Auditory Reception Test.

Null Hypothesis No. 8 was rejected. There was a significant difference ($p \leq .05$) in the Auditory Sequential Memory pretest-posttest mean scores for the experimental group. The kindergarten children that participated in the Yamaha Music Program did make significant gains on the Auditory Sequential Memory Test.

Null Hypothesis No. 9 was not rejected. There was no significant difference in the Auditory Closure pretest-posttest mean scores for the experimental group. The kindergarten children that participated in the Yamaha Music Program did not make significant gains on the Auditory Closure Test.

Null Hypothesis No. 10 was not rejected. There was no significant difference in the Sound Blending pretest-posttest mean scores for the experimental group. The kindergarten children that participated in the Yamaha Music Program did not make significant gains on the Sound Blending Test.

Null Hypothesis No. 11 was not rejected. There was no significant difference in the Wepman Auditory Discrimination pretest-posttest mean scores for the control group. The control group did not make significant gains on the Wepman Auditory Discrimination Test.

Null Hypothesis No. 12 was not rejected. There was no significant difference in the Auditory Reception pretest-posttest mean scores for the control group. The control group did not make significant gains on the Auditory Reception Test.
Null Hypothesis No. 14 was not rejected. There was no significant difference in the Auditory Closure pretest-posttest mean scores for the control group. The control group did not make significant gains on the Auditory Closure Test.

Null Hypothesis No. 15 was not rejected. There was no significant difference in the Sound Blending pretest-posttest mean scores for the control group. The control group did not make significant gains on the Sound Blending Test.

Conclusions

The findings of the present study indicate that the experimental and control groups made some auditory discrimination mean score gains.

Significant t ratios were attained on one pretest-posttest comparison for the experimental group on the Auditory Sequential Memory Test.

There were no significant t ratios attained on the pretest-posttest comparisons for the control group. There were no significant t ratios attained on the posttest mean scores between the experimental and control groups.

Five possible explanations are offered. First, there is not a high relationship between the Auditory Discrimination Tests used and the skills presented in the Music Program. Second, two months may be insufficient time for large gains in auditory discrimination to show up. Third, an organized music program may not be an effective means to improve auditory discrimination abilities in connection with reading for kindergarten children. Fourth, all kindergarten experimental
and control group subjects were receiving normal classroom reading readiness instruction during the course of the experiment by their respective kindergarten teachers. Fifth, the posttests may not be reliable due to the particular weeks selected for administration (December, before a holiday).

**Recommendations for Implementation**

The following factors seemed to have produced the results indicated in the present study. The kindergarten children that were involved in the Music Program were trained to listen. They had specific training in retaining a series of notes and pitches. They had practice in repeating set patterns of note names and pitches. It was the Auditory Sequential Memory Test that most closely correlated with the skills presented in the organized Yamaha Music Program. The subjects in the experimental group were: (1) trained to listen, (2) trained to repeat patterns heard orally, and (3) trained to react to audible sounds.

If the above conditions are met within an elementary school attempting to implement an organized music program, it seems probable that positive effects will be realized for the learners auditory sequential memory ability.

It is important that a trained music teacher be available to instruct the learners and present the essentials of the organized program. The music teacher should be well-informed regarding procedures to be followed and methods of instruction.
Recommendations for Further Research

The following recommendations could be used for further research.

First, different auditory discrimination tests could be used other than the Wepman and the four subtests from the ITPA. Such tests as the Durrell Reading-Listening Series of subtests from the Gates MacGinitie Readiness Skills Test, Hollow Test of Listening Comprehension, Harrison-Stroud Reading Readiness Profiles or the Language Perception Test by Pesa might have measured the effects of the organized music program more accurately.

Second, a series of follow-up studies or a longitudinal study could be undertaken to see if the measured changes were lasting in effect and if the other mean scores gained significantly.

Third, a study could be designed and conducted in an attempt to determine what the effects would be when comparing the sex differences.

Fourth, the study could be designed to control for variables such as IQ, (using the Peabody Picture Test) and normal hearing (using the audiometry test).

Fifth, a study could be designed and conducted which incorporated other grade levels.

Sixth, a study could be designed and conducted which employed subjects identified as having perceptual problems.

Seventh, a study could be designed and conducted in an attempt to determine what attitudinal effects result from the exposure to an organized music program.
Eighth, a study could be designed and conducted which attempts to determine what effects an organized music program has on other subject matter, such as mathematics.
NOTES


BIBLIOGRAPHY


May 15, 1973

Attn: Learning Exploration and Creative Planning Departments

Dear Sirs:

I am currently teaching at Superior Street School in Chatsworth and have observed the Yamaha classes conducted by Paulette Pierson. I was so impressed with the exciting learning experiences provided in your program that it prompted me to develop a proposal for a study to illustrate just one of the positive aspects that music education provides for children entering elementary school.

Following an enjoyable discussion with Bill Neisen, it was suggested that I correspond directly with you. I am presently involved in a reading improvement master's program at California State University at Northridge. To complete my Master's Thesis I would like to utilize your music program for Kindergarten beginning in the fall of this year. I have always had a high interest in music and have believed strongly in its importance and relevance to the elementary school's curriculum. I obtained my Bachelor of Arts degree in Music in 1970. I give organ lessons and present musical experiences throughout the academic year in my second grade class at Superior Street School.

The theory I wish to study generally related the pertinence of music education to reading. If the study yields positive results, it would provide evidence regarding the benefits of an organized music program to the public schools. With your permission and cooperation, I would like to draw upon the resources of one of your teachers, Paulette Pierson, and the basic Yamaha Music Program for Kindergarten children in my study. The basic objective of the study is to determine the effects that a music program has upon a child's auditory discrimination ability when related to beginning reading. I believe that there may be a positive relationship between music skills and reading readiness skills. I have yet to find conclusive evidence that supports this belief. However, this is an open field and could bring about very important changes in the future development of elementary curriculums. The study will take no more than five months or twenty lessons. There will be a control group and an experimental group consisting of no more than seventy children collectively. Pre, mid and post tests will be administered. Controlled variables will include average hearing and average I.Q. I am excited with this research study and eager to conduct it. I feel the expected positive results will be to your advantage as a company with an exceptional music
program and will benefit all concerned educators.

I have enclosed a two-page summary of my research proposal to provide you with more specific details. I look forward to your response and hope that my proposal meets with approval.

Sincerely,

Deborah Johnson