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The effect of differential choral group instruction on children's vocal and rhythmic performance of taught and transfer patterns

Chivington, Amy D., Ph.D.
The Ohio State University, 1990
THE EFFECT OF DIFFERENTIAL CHORAL GROUP INSTRUCTION
ON CHILDREN'S VOCAL AND RHYTHMIC PERFORMANCE
OF TAUGHT AND TRANSFER PATTERNS

Dissertation

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

BY

Amy D. Chivington, B.M.E., M A.

* * * * *

The Ohio State University

1990

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To My Family
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TABLE OF CONTENTS

DEDICATION............................................. ii
ACKNOWLEDGEMENTS............................. iii
VITA...................................................... iv
FIELDS OF STUDY...................................... v
LIST OF TABLES........................................ ix
LIST OF FIGURES....................................... x

CHAPTER

I. INTRODUCTION.......................................... 1
   Need for the Study................................. 2
   Statement of the Problem....................... 6
   Definitions........................................ 7
   Limitations........................................ 8

II. REVIEW OF LITERATURE............................ 9
   Introduction...................................... 9
   The Child Voice.................................... 9
   Development..................................... 9
   Range............................................. 11
   Factors That Have An Effect
      On In-tune Singing........................... 19
   Music Reading.................................... 24
   Music Perception Studies..................... 25
   Rhythm........................................... 33
   Tonal Patterns and Melody................... 46
Scale Direction and Interval Direction . 54
Music Reading as An Integrated Process . 57
Transfer of Training . . . . . 63
Definition . . . . . 63
Instructional Implications When Teaching For Transfer . 65
Studies of Transfer in Music Education . 67

III. METHODOLOGY . . . . . . . . . . 70
Introduction . . . . . . . . 70
Subjects . . . . . . 70
Independent Variable and Instructional Procedures . . . 72
Dependent Measures and
Testing Procedures . . . . . . . . . . 84
Pretest and Posttest . . . . . . . . . . 84
Instrumentation . . . . . . . . . . 86
Testing Procedure . . . . . . . . . . 86
Evaluation of Pretest and Posttest. . 87
Pilot Study . . . . . 88

IV. RESULTS . . . . . . . . . . . . . . . . 90
Introduction . . . . . . . . 90
Pretest Rhythm and Melody Ratings . . . . 90
Implementation of Instruction . . . . . . 92
Teacher Approval . . . . . . . . . . 92
Attention to Rhythmic and Melodic Patterns . 93
Song Performance . . . . . . . . 97
Length of Sessions . . . . . 97
Statistical Comparisons Between Groups Receiving Differential Instruction on the Performance of Taught Vs. Transfer Patterns . . 97

V. CONCLUSIONS . . . . . . . . . . . . . . . . 105
Introduction . . . . . . . . 105
Summary of Research . . . . . . . . . 105
Purpose of the Study . . . . . . . . 105
Pretest. . . . . . . . . 106
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Treatment</td>
<td>107</td>
</tr>
<tr>
<td>Posttest</td>
<td>114</td>
</tr>
<tr>
<td>Interjudge Reliability of Instruction</td>
<td>115</td>
</tr>
<tr>
<td>Statistical Comparisons Between Groups Receiving Differential Treatment on the Performance of Taught Vs. Transfer Patterns</td>
<td>117</td>
</tr>
<tr>
<td>Discussion of Results</td>
<td>120</td>
</tr>
<tr>
<td>Recommendations</td>
<td>129</td>
</tr>
<tr>
<td>References</td>
<td>131</td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td>A. Song Literature</td>
<td>140</td>
</tr>
<tr>
<td>B. Warm-Up Exercises</td>
<td>142</td>
</tr>
<tr>
<td>C. Rhythmic, Tonal and Melodic Patterns</td>
<td>145</td>
</tr>
<tr>
<td>D. Equipment List</td>
<td>149</td>
</tr>
<tr>
<td>E. Pretest</td>
<td>151</td>
</tr>
<tr>
<td>F. Posttest</td>
<td>156</td>
</tr>
<tr>
<td>G. Pretest Rating Sheet</td>
<td>161</td>
</tr>
<tr>
<td>H. Posttest Rating Sheet</td>
<td>165</td>
</tr>
<tr>
<td>I. Validation of Instruction</td>
<td>170</td>
</tr>
<tr>
<td>J. Interjudge Reliability On Evaluation of Instruction</td>
<td>172</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

## TABLE

1. Implementation of Instruction
   Instructional Criteria, Experimental Group, Control Group. . 95

2. Analysis of Variance
   Posttest Taught Vs. Transfer Rhythm Pattern Performance . . 100

3. Summary of Group Mean Scores
   Posttest Rhythm Pattern Performance . 100

4. Analysis of Variance
   Posttest Taught Vs. Transfer Melody Pattern Performance . . 103

5. Summary of Group Means Scores
   Posttest Melody Pattern Performance . 103
LIST OF FIGURES

FIGURE

1. A Posttest Mean Comparison of Rhythmic and Melodic Taught Vs. Transfer Patterns. . 99
Chapter I

INTRODUCTION

Singing has traditionally been one of the core activities in the elementary music curriculum. In fact, at one time singing comprised the entire elementary music program (Birge, 1937). Today, singing remains central to the elementary music experience, although other enriching musical experiences have been added as well. Children should have the opportunity to develop their voices with the guidance of a skilled music teacher (Atterbury, 1984; Gould, 1968; Rao, 1987).

As children progress through elementary school, many have the opportunity to take part in a choral experience. The value of a choral experience for children has been the subject of discussion by many choral teachers and conductors of children's choirs. Singing in a choir teaches children to work together as they develop poise and confidence. The choral experience develops good work habits and self discipline. And most importantly, through the choral experience, children can develop musicianship.
The skills necessary for choral singing include music reading, analysis and vocal technique. Rao (1987) states that skills can be developed through the choral music experience as a means of solving such musical problems as rhythm, harmony, balance and blend. Swears (1985) states that the elementary choir can provide added time and opportunity to develop accurate, expressive singers.

Children's singing can be thought of as a developmental process. Children progress from speaking patterns of words, through an awareness of melodic contour, to being able to sing melodies tunefully. Gould (1969) observes that a singer must be led to develop a vocabulary of aural and conceptual skills as well as a vocabulary of vocal motor skills. He concludes that an awareness of the elements of music will lead to a more comprehensive sensitivity and response to music.

Need for the Study

One of the important skills in the musical development of an individual is music reading. This skill can help lead the musician to independent musical learning and performance. Petzold (1963) explains that this process depends on three perceptual levels.
First is the auditory perception of musical sounds. Next, the visual perception of musical symbols is important. And finally, there is an integrative, internalized process through which the individual organizes auditory and visual perceptions of given stimuli. Then the individual can react to identical or similar stimuli as they appear in new learning situations.

The development of music reading skills is important to the young musician and the importance of developing these skills has been the focus of several research studies (Gebhardt, 1973; Jarvis, 1980; MacKnight, 1975; Michalski, 1971; Petzold, 1960). In the investigation of effective means of training children to read music, MacKnight (1975) stated melodic training based on auditory and visual recognition of a series of tonal patterns is an effective strategy to teach notation to beginning wind instrumentalists. Several studies concluded that vocalization is a valuable strategy to improve music reading (Grutzmacher, 1987; MacKnight, 1975; Petzold, 1960).

Petzold (1963) described music reading as an integrative, internalized process leading to the organization of auditory musical sounds and visual perception of musical symbols, and then the generalization of that knowledge. Such generalization is an
example of transfer of learning. Transfer assumes that materials have been mastered and can be applied in a new learning task. Bruner (1960) concludes that the first object of any act of learning, beyond its intrinsic pleasure, is to serve in future learning situations. The broadening and deepening of knowledge is at the very core of the educational experience.

Teaching strategies to enhance transfer of learning have been investigated by several noted psychologists. Learning tasks must be practiced before they can be generalized to new situations. If learning tasks are similar, transfer is enhanced. Learning tasks should be structured from easier to more difficult. Training and test conditions should be similar. Task variety aids transfer. Coaching and feedback from the teacher help (Ellis, 1979). Gelsheiser (1986) observes that in addition to teacher feedback, students need to discover concepts for themselves, patterns, regularities and invariables in a task. Review questions can enhance transfer. Finally, Gagne and White (1978) state that learning should be linked together into a series of meaningful experiences.
Training for transfer is important in any educational endeavor. As teachers work with young singers in a choir, training them to be musically literate is vital to the children developing into musically independent learners. Integrating reading skill building activities into the children's choral rehearsal may prove beneficial to the transfer of learned rhythmic and melodic patterns to a new situation, such as sightreading. The current study was designed to provide information that may be useful in planning instructional strategies to facilitate transfer of training of music reading skills in an elementary children's choir.

The rote to note methodology has been used extensively in teaching song materials to children. The method has often been the primary instructional choice in elementary choirs (Anderson and Lawrence, 1985; Nye and Nye, 1970; Swears, 1985). This approach may enhance the development of music reading skills and the generalization of music reading ability to performance and sightreading. A different approach consisting of the prior introduction of learned rhythmic and melodic patterns might also lead to improved performance and sightreading by elementary choir members. The current study was designed to provide information that may be useful in planning instructional strategies
to facilitate transfer of training of music reading skills in an elementary children's choir. The results of this study may have instructional implications for the elementary music specialist or choir director.

Statement of the Problem

The current study was designed to assess the transfer of learned rhythmic and melodic patterns to performance and sightreading in an elementary children's choir. Specifically, the study was designed to answer these research questions:

1. How well can children read rhythmic and melodic patterns in a choir prior to instruction?

2. To what degree will subjects who receive instruction in rhythmic and melodic patterns during the learning of songs be able to perform taught and transfer patterns on the posttest?

3. To what degree will subjects who do not receive specific instruction in rhythmic and melodic patterns during the learning of songs be able to perform taught and transfer patterns on the posttest?

4. Will there be a significant difference between the two groups in their performance of rhythmic and melodic patterns?
Will there be a significant difference between the performance of taught versus transfer patterns? Will there be a significant interaction between groups receiving differential instruction in the performance of taught versus transfer patterns?

Definitions

Elementary children's choir. Students in grades four and five currently enrolled in elementary choir, selected by the elementary music specialist.

Rhythmic patterns. Seven two-measure patterns and one three-measure pattern of notes written on a one-line staff with the meter signature indicated.

Tonal patterns. A series of five short pitch patterns, indicated with solfege syllables.

Melodic patterns. A series of eight patterns which combine rhythmic and tonal patterns on a treble staff.

Transfer. Materials which have been learned can be applied in a novel context.

Sightreading. The ability to read and perform music at first sight.
Pretest. An investigator designed instrument to assess the rhythmic and melodic pattern performance of subjects prior to the treatment phase of this study.

Posttest. An investigator designed instrument to assess the rhythmic and melodic pattern performance of subjects following the treatment phase of this study.

Rating sheet. An investigator designed form used to evaluate the performance of subjects on the pretest and the posttest.

Validation of instruction. An investigator designed instrument designed to document the implementation of instruction.

Limitations

1. The subjects in this study were chosen and auditioned prior to the implementation of this study.

2. The instructional treatment phase of the experiment was limited to a ten week period.

3. The two groups in this study were at different schools. Inherent differences in the populations of these two schools may have affected results.
Chapter II

REVIEW OF LITERATURE

The review of literature is presented in three sections as follows: (a) the child voice; (b) music reading; and (c) transfer of training. The literature and research studies presented provided the foundation for the design and implementation of the present study.

The Child Voice

Development. As children mature, their vocal capabilities change. Gould (1969) investigated the singing capabilities of children at various age levels. This study investigated the effect of training on the development of children's singing voices.

Several conclusions reached in the Gould (1969) study have important implications for the elementary music teacher. Concept and skill development are important to the development of a successful singing experience at the elementary level. Two basic principles are involved in learning to use the singing voice with
increased success and satisfaction. Children must learn to hear, judge and control their own voices and they must experience unison. Skills and concepts as they relate to the singing voice need to be developed sequentially. As the singing voice improves, combining the tonal image with the vocal response is important. Gould (1969) concludes after children understand the concepts of singing, they must develop a vocabulary of aural and mental skills and vocal motor skills.

Welch (1966) agrees with Gould (1969) that singing is a developmental ability and that teaching strategies must be designed accordingly. From an extensive review of literature, Welch (1986) concludes that vocal pitch accuracy is affected by the range of the model presented. Children match pitches in lower ranges more accurately, and vocal pitch accuracy is affected by training.

Welch (1986) summarizes the literature stating that singing develops along a continuum from out-of-tune singing to in-tune singing. In the first stage of development, words of the song are the focus of interest. Children choose a comfortable pitch in response to a pitch stimulus, rather than match the pitch given. There is evidence that the response pitch is frequently in-tune with the stimulus pitch. As children enter stage two, they match
more pitches in a melody. They become aware they have some control over producing accurate pitches. In stage three, pitch matching accuracy improves and melodic outline more closely follows contour. Vocal range continues to expand. In stage four, children gain increasing ability to match pitches, but they might change tonality if the pitches become uncomfortable. Children in stage five sing a melody accurately and their vocal range has expanded upward and downward.

Range. Several studies and articles have investigated the range of the child voice. Some of this literature also relates the effect of training on the singing range of the child voice.

Jersild and Bienstock (1934) investigated the range of children's singing voices and the effect of training on the singing range. After extensive data collection on a large sample of children from two to ten years old, the following conclusions were stated. Children's vocal range expands with maturity and training. Children's vocal range is lower in nursery school, and expands rapidly in the first three grades of elementary school. Training at this age is important to the development of children's singing range. Jersild and Bienstock (1934) also state that when planning group singing experiences, choosing song materials with
a comfortable range of notes for the majority of children is important. After confidence is gained by the children, range can be extended by adding notes to the basic range. Finally, this study suggests that nursery school children can expand their range with practice, and training might benefit range extension even at age three.

Smith (1963) investigated the effect of group training on group singing ability in a sample of three and four year old children. The children were evaluated following two semesters of daily music instruction. Smith (1963) concluded that lower range improvement was more consistent following training, and tuneful singing ability of the experimental group improved significantly as a result of training. Some of the children could sing notes above a4, but the transition to the upper notes seemed to be a problem for the children. Smith (1963) agreed with Jersild and Bienstock (1934) that self confidence affected vocal range.

Boardman (1964) investigated the effect of preschool training on the development of vocal accuracy in young children. Children in kindergarten, first and second grades were the subjects in this study. A test of short tonal patterns was given to the children to assess their vocal accuracy in low, middle and high ranges.
Boardman (1964) concluded children had greater difficulty singing in the higher range of their voice. She also concluded that the results of this study supported the view that preschool training may accelerate the development of vocal accuracy.

Flowers and Dunne-Sousa (1990) completed a study of ninety-three preschool school children from three to five years old to assess children's ability to echo short pitch patterns in relation to maintaining a tonal center in self-chosen and taught songs. One of the considerations of the study was age differences in use of vocal range and another was extent of range used for different singing tasks. They commented that children are capable of producing a wider range of pitches than are generally sung. This may account partially for the inconsistency between recommended and observed vocal ranges for children. Individual differences exist in children's vocal ranges and must be given consideration when designing activities or interpreting results. In this study, range was most restricted when children sang the self-chosen song. The taught song required a wider range, but the range was similar to the self-chosen song. When the children echoed short pitch patterns, they took more risks. Although several sang below given pitch, their range was nearly always
greater than in singing songs. This result may indicate that with practice in echoing pitch patterns, children could extend their useful vocal range for singing songs.

Joyner (1969) completed a study of thirty-two monotone eleven year old boys. All of these boys had been identified by their teachers as monotones. All of the monotones took the Bentley pitch discrimination and tonal memory tests. Then each was given a vocal production test, singing a chosen song and several ascending and descending scales. Joyner (1969) concluded that children's vocal pitch accuracy was affected by the target model. When the target model pitch was lowered, over one-third of the boys sang more accurately. Joyner (1969) recommended that initial singing experiences should begin at a range where a child sings comfortably, and can extend from there.

Culpepper (1962) completed a study of defective singing of third and fourth grade elementary students. The children in this study were taped individually as they sang two selected songs. They were divided into groups of best and worst singers. The worst singers were randomly assigned to control and treatment groups. Following treatment, best and worst singing groups were
compared and the following observations were made. The singing range of children was lower than that presented in the context of the printed music. After daily instruction administered over a four and one-half month period, defective singers responded to instruction, improving on all singing factors.

Wilson (1970) questioned whether important individual differences in children's vocal range exist at all grade levels. This longitudinal study examined voices in grades one through twelve. Wilson administered a voice range and singing test, personal interviews, used school records and music series for her investigation. The conclusions reached in this study have important implications for the elementary music teacher and summarize and support the findings of earlier studies. Wilson (1970) found the following:

1. Marked individual differences in children's voice compass and span exist at all grade levels.

2. Children's voices develop at different rates at all grades.

3. Training does not decrease individual differences for ranges, but the importance of considering individual differences for unison singing decreases as pitches
common to most children increase.

4. The range of pitches that children consider comfortable for singing is considerably lower than the range of e1 to e2 that is traditionally recommended by music educators and considerably lower than the average range of songs in the current music series.

5. The average range of songs in current music series is considerably higher than the range that the majority of the children can match at all grades.

6. The average voice range of boys is slightly lower than the average voice range of girls at ages six, seven, ten and eleven.

7. The percent of children matching pitches in the low range is higher for boys than for girls.

8. The percent of children matching pitches in the high range is higher for girls than for boys.

9. Marked differences in tessitura of children's voices exist both between and within sexes.

10. The range span of boys and girls is not significantly different, except at age eleven preceding puberty when some boys' range span becomes narrower.
11. Traditional methods and procedures for singing with children are in direct conflict with research on the child voice.

12. Music educators in general have ignored research on the child voice.

13. Singing below the range of e1 to e2 does not harm the child voice if voices are not forced.

14. Providing for individual differences and adjusting the pitch range to the children for classroom singing improves attitudes toward singing and eliminates non-singers. The improvement is particularly noticeable with boys.

15. Self-confidence affects vocal range.

16. Differences in musical training increase individual differences in vocal range.

17. Elementary teachers in general need to know more about vocal techniques as applied to the child voice and the psychology of learning.

18. Elementary music teachers need to know the vocal range of each child and need to be able to transpose and arrange
music in order to provide successful singing experiences for all children. (pp. 164-166)

Some child voice research and articles have supported the finding that the range of the child voice is more extensive and children need to use a wide range of notes to develop their singing voices. Wassum (1979) completed a five year longitudinal study of children's voices in grades one through six. Children were taped individually periodically throughout the study. Scale patterns were played on tone bells and children responded by singing scales. Also, they sang a favorite song with no accompaniment or suggestion of initial pitch given. The highest and lowest phonated sounds were considered extremes of range.

Rao (1987) suggests an average range for children's singing voices is from c4 - f5(g5). She believes using a wide range of pitch is essential in the development of singing skills and listening skills. Ingram (1953) agrees that children should use a wide range pitch to help develop musical skills. Ingram (1953) concludes that the singing range of children by the age of nine to eleven years is b3 to g5. Apfelstadt (1982) and Frodsham (1955) support these findings.
In summary, Forcucci (1975) states that the music teacher should begin singing experiences with a lower range of notes where the children can sing, and then extend the range from there. Forcucci (1975) also advises teachers to explain to children that they are learning an acquired skill which requires practice.


Smith (1973) completed a study to determine if the in-tune singing of sixth grade children is affected by the physical presence of their peers, by the presence of accompanying voices, or by the pitch range where they are singing. The children were tape recorded as they sang "America" in the keys of F major and C major. There were three experimental conditions used, including peer group present-accompanied, peer group absent-accompanied, and
peer group absent-unaccompanied. A scoring scale was used to evaluate the in-tuneness of each subject in the recordings. The six recordings were also used to score five factors of tone quality for each subject.

Smith (1973) concluded that the presence of peers did not affect the in-tuneness of children's unison singing. Range did affect in-tuneness of children's voices. The children in the study sang more in tune in the lower range. Five factors of tone quality related to in-tuneness of children's singing: brilliance, focus, clarity, nasality, and overall quality. In-tune singing ability was related to pitch discrimination and tonal memory. Thirty-five to forty percent of the sample tested sang in-tune fifty percent of the time or less. And finally, almost the entire population had the potential to sing in-tune.

Goetze (1986) criticized the Smith (1973) study and observed that the differences in the performances of the students were not analyzed or contrasted across the experimental conditions. Goetze (1986) concluded further research was needed to evaluate the tuneful singing of children in unison alone and with peers.
Goetze (1986) completed a study which was concerned with two factors that affect accuracy of children's singing: the presence of other voices in unison singing compared to individual singing, and the use of text rather than a neutral syllable. Kindergarten, first and third grade elementary school students were the subjects in this study. The children were taught two melodic phrases of equal length, intervallic content and direction. With two other children present, each child was tape recorded as they imitated one of the melodies in response to the investigator's voice. While singing with five other subjects and the investigator, unison singing responses were recorded. Both phrases were sung with text and on the syllable "loo."

The data of the Goetze (1986) study supported the following conclusions. Subjects sang more accurately when they sang individually rather than in unison. They sang more accurately on the syllable "loo." Kindergarten and first graders benefitted most from the "loo" singing. The third graders sang more accurately than the kindergartners or first graders. Girls sang more accurately than boys in unison singing. And the difference between boys' individual and unison responses was greater than that of the girls.
Phillips (1983) completed a study on the effect of group breath control training on the singing ability of second, third, and fourth grade children. Children were randomly assigned to treatment and control groups. The experimental treatment group received breath control training exercises as part of group training during choir rehearsals. The control group did not receive the breath control training. Statistical analysis supported Phillips (1983) conclusion, "vocal training involving specific drill and vocal exercises for breath control is appropriate and beneficial for children's singing" (p. 179). He concluded that breath control training for children in grades two, three and four had a significant effect changing "chest" breathing to abdominal/diaphragmatic costal breathing. Group training also had a significant effect on the singing ability of children in grades two, three and four on the measures of vocal pitch range, intensity and pitch accuracy. The children who received the experimental treatment generally improved on these measures.

Kuhn and Sims (1983) tested a group of first graders singing "Row, Row, Row Your Boat" using five variables: key, song tones, accompaniment, order and sequence. Students sang with both melodic and harmonic accompaniment. They sang with just the
melody, just the harmony or a cappella with no other stimulus sound present. The accompanying melodic stimulus was the adult female voice and the accompanying harmonic stimulus was guitar repeating the tonic chord. Tempo was constant for all the treatment conditions.

The results of this study indicated that none of the four methods of accompanying the song was more effective than others in enhancing accurate vocal performance. The key in which the song was pitched had a significant effect on the number of pitches matched by the children. They sang most accurately in a lower key, Bb major. The children had a tendency to sing in a key that was comfortable for them. Kuhn and Sims (1983) advised teachers to begin singing activities in a comfortable range for young singers and extend the range from there.

Each of the above studies investigated children's in-tune singing, relating it to various factors. The Smith (1973) and the Goetze (1986) studies investigated the effect of peers on children's singing ability. The Smith (1973) study concluded presence or absence of peers had no affect on children's in-tune singing ability. Goetze (1986) concluded children sing more in-tune individually and they sing more in-tune on the syllable "loo" than with text.
Phillips (1983) concluded that group breath control training had an effect on the in-tune singing of elementary children. Kuhn and Sims (1983) concluded simultaneous melodic and harmonic accompaniment did not seem to effect children's singing accuracy, but the pitch level did effect singing. Beginning singing activities at a comfortable pitch level for children was important.

Music Reading

Many of the research studies reviewed have supported the conclusion that training enhances the development of the singing voice. Children's vocal capabilities develop as a result of training and maturation. As children develop the ability to sing musically, they can develop musical literacy. Music reading skills enable children to interpret and understand their musical performance. Musical literacy is an important step that can enable children to become independent musical learners.

Music reading is a complex skill. The process involves the auditory perception of sounds, visual perception of symbols, and then the integration of the auditory and visual perceptions into performance. The performance can be vocal or instrumental (Petzold, 1960).
Exactly how the individual progresses from rote singing to musical literacy has not been explained by research (Gordon, 1971). However, music reading has been the focus of several research studies. These studies have been directed to the various elements of a music reading experience. In this section of the review of literature, studies which concentrate on the development of music literacy will be cited.

**Music Perception Studies.** Petzold (1960) completed a study of the perception of music symbols in music reading by normal children and those musically gifted. The focus of this study was primarily reading music symbols which indicate pitch. Subjects in this two phase study were fourth and sixth grade elementary students. In phase one of the study, song materials were analyzed to identify common tonal patterns which could be used as test items, a sample of them was selected and subjects were tested. This portion of the study provided a "...means of examining perception as the visual and aural identification and recognition of tonal configurations" (p. 272). Phase one also provided a basis to plan learning tasks for phase two of the study and a means of testing learning outcomes.
In phase two, two learning situations were used which differed in sequence of tasks, but were identical in content. The order of the sequence for one group was to learn five tonal patterns and then learn a short song made up of the five patterns. The subjects in another group learned the song first, then the tonal patterns. Results of phase two indicated musically gifted children performed better on each task. The song was a more complex task, not the tonal patterns in either task sequence. Average fourth graders and average and gifted sixth graders recognized tonal patterns more consistently when the song to pattern sequence was followed.

Conclusions in the Petzold (1960) study have implications for the teaching of music reading. He concluded that the time allowed for phase two was not long enough. More sessions, not longer ones, would lead to a greater understanding of concepts about musical notation. Accurate reading of musical notation was more likely if the emphasis was on the significance of the notation, not imitation of musical materials. Songs could be learned more effectively if tonal patterns were practiced first. If the study of patterns was to be the approach to music reading, emphasis needed to be placed on the recognition and design of the patterns. Students needed
Petzold (1960) concluded this study by stating further research was needed in auditory and visual perception in music. In a later study, Petzold (1963) investigated the development of the auditory perception of musical sounds by first through sixth grade children. In the introduction to the study, he stated that music reading skills are crucial to the musical development of the individual. He observed though music educators do not agree on the degree of music reading skill that elementary children should develop, the elementary music program does provide children with opportunities to develop minimal reading skills. Music educators agreed that pre-music reading activities should help children develop their aural understanding of music.

The purpose of the Petzold (1963) study was to determine the differences in children's perception and response to the auditory presentation of musical sounds. The study was primarily concerned with melody, which is later perceived in terms of pitch symbols as children develop music reading skills. Children were randomly selected from grades one through six to take part in this study. All testing was done individually and tape recorded.
The study was designed to evaluate perception of musical sounds as the aural identification of similarities and differences between tonal patterns. Two types of evaluation were used. One was a test measuring aural perception of short tonal patterns which varied in length and complexity. Another test used musical phrases and evaluated the rate children learn phrases and the amount of recognition of similarities and differences in these larger, more complete units of musical thought.

Results of the study showed that in tasks measuring the performance of auditory perception of musical sounds, there was no significant difference between girls and boys. Auditory perception developed as children matured. Musical training and other musical experience enhanced the development of auditory perception of musical sounds. The addition of the melodic element to rhythmic element had no significant effect on the auditory perception of the melodic material. Children in every grade level were able to make consistent responses to an auditory stimulus. The rate of learning musical material did not reflect the variables of age and musical experience as the scores for overall achievement did. Auditory perception of short tonal patterns came before the perception of larger units.
Petzold's (1963) findings showed that age and musical experience influenced the development of auditory perception of musical sounds. Since children had different musical abilities within each grade level, music teaching strategies should vary, and encourage more effective musical learning for all children. Most importantly, rote learning of songs did not provide children with the opportunity to become musically independent. Aural understanding was the result of intelligent thought, and children understood basic musical concepts to enable them to make independent musical judgments.

Bergan (1967) completed a perceptual study to assess the relationships among imagery for musical sounds, accuracy in the identification of pitch, and musical memory. Imagery in this study was evaluated by a questionnaire, pitch identification was measured by the ability to identify a previously heard tone in a series of tones, and musical memory was evaluated by the Drake Test of Musical Memory. One hypothesis of the study stated that there is a positive correlation between pitch judgment and imagery. Another hypothesis added that a positive correlation exists between pitch judgment and musical memory.
Bergan (1967) presents a rationale for the hypothesis that pitch judgment and imagery are positively correlated. He concludes that when making an evaluation of pitch, a sound, one relies on internal thought processes, not on verbalization. A tonal image is created which closely represents the actual experience of hearing. Vivid imagery adds to the amount of information which can be used for making judgments concerning pitch. Bergan (1967) adds that individuals may experience vivid auditory images in certain situations, and not in others. In this study, the relationship between imagery and pitch is limited to the imagery for musical sounds.

The Bergan (1967) study statistically supports both of the hypotheses. There is a positive correlation between pitch judgment and imagery and a positive correlation between pitch judgment and musical memory. This study concludes that being able to make judgments relating to the pitch of sounds depends on the adequate internal representations of those sounds.

Pedersen and Pedersen (1970) completed a study which examined the relationships of (a) pitch discrimination with vocal pitch production, (b) pitch discrimination and vocal pitch production with sex, and (c) pitch discrimination and vocal pitch
production with knowledge of musical symbols. Both auditory and visual perception were used by the subjects in this study. This correlational study was completed over a two year period. Sixth grade elementary students were subjects in the study.

Tests administered to the groups included a music symbols test, a pitch discrimination test and a vocal production test. The music symbols test was a series of short answer questions that required subjects to identify music symbols and terms. The pitch discrimination test measured the ability of subjects to discriminate whether two sets of tones were identical or not. The vocal pitch production test required subjects to sing a pitch or pitches after they had heard them produced on a musical instrument.

The experimental procedure was identical for both groups. The music symbols test was given to the entire group. Two weeks later, the pitch discrimination test and vocal pitch production test were given to the subjects individually at a single testing session.

Evidence from this study indicated that although pitch discrimination and knowledge of musical symbols may have had a relationship, it was not large enough or consistent enough to have predictive value. Correlations between the vocal pitch production
test and the music symbols test were significant. Results seemed to affirm that the kind of understanding evaluated by the music symbols test was more related to vocal pitch production than to vocal pitch discrimination. In this study males and females did not differ significantly in ability to discriminate or sing single pitches, intervals or a sequence of pitches. The results supported the conclusion that a person who does well on one type of pitch discrimination will do well on others.

To summarize this section of literature, each of the studies reviewed had conclusions valuable to the understanding of musical perception. Petzold (1960) concluded the significance of notation needs emphasis, not mere imitation if accurate music reading is important. Songs can be learned more effectively if tonal patterns are practiced first. The recognition and design of tonal patterns should be emphasized if tonal pattern instruction is to lead to music reading.

The Petzold (1963) study offers important conclusions concerning the development of auditory perception. Auditory perception develops with maturity and no significant differences in development are noted between genders. Auditory perception responds to training.
The Bergan (1967) and the Pedersen and Pedersen (1970) studies were correlational studies. Bergan (1967) found a positive correlation among pitch judgment, imagery and musical memory. The Pedersen and Pedersen (1970) study found that pitch discrimination and knowledge of musical symbols may have a relationship, but not large or consistent enough to have much predictive value. However, the knowledge of musical symbols and vocal pitch production did have a positive correlation.

Visual and auditory perception of musical sounds and symbols are a part of the continuum of experiences which lead children to musical literacy. A music reading experience combines rhythmic, tonal and melodic elements into a performance experience. In a children's choir, harmony and accompaniment can be added to the vocal line of the melody. Studies that relate these elements to the musical experience of children will be the focus of the next section in this review of literature.

Rhythm. Rhythmic performance is basic to a musical performance. Several studies have investigated the development of children's rhythmic abilities and skill development. Some have researched music instruction as it relates to rhythmic performance and literacy.
Greishaber (1987) reviewed research relating to children's finger or hand tapping performance. Children's ability to tap rhythmically develops as they mature. Petzold (1963) found that by grade three, children can synchronize with a periodic stimulus. Petzold (1963) noted that boys and girls did not differ significantly in this ability. Greishaber (1987) reviewed research which supports the conclusion that learning disabled children perform better at slower tempos. Music teachers need to remember to present rhythm patterns at slower tempi. Also, separating rhythm from tempo is an important strategy.

Greishaber (1987) noted that controversy exists as to whether imitative rhythmic tapping ability plateaus at grade three as Petzold (1963) concluded. Cox (1977) concluded that there is increasing accuracy in imitative tapping ability and that there is no significant difference between girls and boys in this ability. Of interest in this study was the conclusion that the use of melodic versus nonmelodic stimuli in rhythmic tapping research does not affect its performance. However, Greishaber (1987) observed that more research needs to be done in this area.
Two studies concerning the rhythmic abilities of young children include a study by Rainbow (1981) and Schleuter and Schleuter (1985).

Rainbow (1981) designed a three year, longitudinal study to investigate the role of maturation on the ability of preschool children to learn specific rhythmic tasks. Fourteen tasks were used and included five which required subjects to keep a steady beat to recorded piano music. The children had to clap, slap hands on knees, march, clap and march, and tap rhythm sticks in this series. Tasks six through eight required the children to echo vocally text presented in rhythm patterns. Tasks nine through eleven required the children to immediately clap the patterns they had vocalized. In tasks twelve through fourteen, the teacher clapped one of the patterns and children were asked to imitate the model. The children had instruction for fifteen minutes two or three times per week over a three year period. They were videotaped for assessment regularly over this period.

The conclusions of the Rainbow (1981) study were that three year olds most successfully completed the tasks which required a vocal response, and approximately fifty percent of them were successful at those tasks. Clapping a rhythm pattern after
vocalizing, clapping a steady beat, and tapping a steady beat to recorded music with rhythm sticks were similarly difficult for three year olds in this study. Ten to fourteen percent of them could do these tasks. Tasks of echo clapping and marching were very difficult for three year olds, with fifty-two to seventy-seven percent unsuccessful. Marching and clapping to music was the most difficult for the three year olds. About eighty percent were not successful at this task.

Four year olds in the Rainbow (1981) study performed significantly better on all tasks, except the vocal response tasks which were similarly difficult for both groups. Marching and clapping remained very difficult for this group, with less than fifteen percent were successful.

Implications for instruction from this study are that:

1. Three year olds are able to perceive and duplicate rhythm patterns if a proper response can be used.

2. Vocal chanting is an appropriate strategy to teach rhythmic activities to young children.

3. Marching is a questionable rhythmic evaluative activity for preschoolers.
4. The process of children in learning rhythmic tasks is slow. Rainbow (1981) states that there is a need for more research in this area to help music teachers develop more effective rhythmic teaching strategies. Schleuter and Schleuter (1985) investigated the relationship of grade level and sex with rhythmic responses of clapping, chanting and stepping with kindergarten through third graders after one year of music instruction. This was the first regular music instruction that any of the children had received. Instruction included the development of rhythmic and tonal concepts. Clapping, chanting and stepping were used regularly as instruction techniques. Testing followed which required children to echo clap, chant on "loo" syllables, and march in place to patterns. The results were in agreement with the Rainbow (1981) study. Stepping was the most difficult activity for the children. Chanting response scores were highest for kindergarten and grade one. Clapping response scores were highest for grades two and three. The ability to make accurate physical rhythmic responses seemed to be influenced by maturation. In this study, children responded more accurately as grade levels advanced. Other studies have confirmed
that maturation influences rhythmic response in children (Cox, 1977; Serafine, 1979).

The Schleuter and Schleuter (1985) study also compared the responses of boys and girls. Girls' scores were consistently higher on all responses in grades one through three.

Atterbury (1983) compared rhythm pattern perception and performance in a group of forty normal and learning disabled readers, ages seven and eight. Rhythm pattern perception and performance were assessed using three methods of presentation, tapped, melodic, tapped and spoken performance and echo performance. Gordon's Primary Measures of Audiation (Gordon, 1979) was used for all subjects, and adapted for the learning disabled subjects.

The sets of tests in this study were administered individually to all subjects. The three perception tests taped pairs of one measure rhythms. Each pair was presented by tapping on a woodblock, melodically played on piano, and tapped and spoken on using "ta-ti" syllables. The next group of tests were rhythm performance tasks in which children clapped patterns. The Gordon test was modified for the learning disabled children by removing the pencil and paper response, and cue words from the tapes. Instead,
the children could point to happy faces or sad faces to indicate answers. Subjects in the study were tested three times during this study.

Results of this study showed that learning disabled and normal readers perceive simple rhythm patterns in much the same manner. However, difficult rhythm patterns proved difficult for learning disabled students to perceive and reproduce. Atterbury (1983) concluded that rhythm instruction for mainstreamed children should consist of two separate parts, perception and performance. Also of interest was the conclusion that tapped and spoken rhythms were significantly better than melodic or tapped for normal and learning disabled children. Atterbury (1983) concluded that music educators should use rhythm syllables to teach rhythm patterns to children in the lower elementary grades. Children's learning should be considered as a process.

Several studies and articles have investigated methods of instruction to teach rhythm performance and rhythmic literacy.

Gordon (1970) designed a set of sequential objectives to teach rhythm. The methodology was based on the view that musical experience by rote preceded the understanding of notation. The method was also based on the premise that rhythm had three
elements: tempo beats, meter beats and melodic rhythm. Tempo beats provided the base upon which the other elements rest. Meter beats represented the fact that meter in poetry and music moved in two's and three's.

Gordon's (1970) steps in the sequence provide aural/oral practice in discrimination of the various elements of rhythm. This method provides practice in the verbal association of proper names of musical elements with their performance. Verbal association is used to add syllables to various patterns. Synthesis activities include the recognition of patterns in song materials. Generalization activities include aural/oral practice of unfamiliar rhythmic elements. Creativity is added through the improvisation of duple, triple, and combined patterns.

Bebeau (1982) compared two methods of rhythm reading instruction and their effect on rhythmic reading accuracy. Third grade children were randomly assigned to one of two treatment groups. One group received training in rhythmic reading which required them to apply mathematical cues while they kept a steady pulse. Another group used a speech cue method. When rhythmic symbols were read, the children identified the symbol by word and hand movement. They said the word and did the body
movement, and kept a steady pulse with proper accents.

Following a four week treatment period in which children received instruction for fifteen minutes daily, the children were tested. Scores on the instrument indicated that both the traditional (mathematical) method and the speech cue method were effective in teaching rhythm reading to third grade children. Systematic, regular instruction using either method resulted in gains in rhythmic reading. Within-group variance scores of the speech cue method group were less than the traditional method. This study concluded that a strategy which reduces performance variation as a result of instruction is important. This study provided "evidence indicating that when instructional procedures in rhythm reading are subjected to task analysis and empirical verification, highly accurate reading of rather complex rhythmic patterns can become a reality, even for the young child" (p. 118).

Colley (1987) investigated the effects of three syllabic recitation systems on improving rhythm reading by second and third grade children. The Kodaly, Gordon and word methods were chosen for this study. Three second grade classes and three third grade classes were randomly assigned to one of the three treatment
groups. One second and one third grade class served as the control groups in this study and received no rhythmic notation instruction.

Following eleven weeks of instruction, all of the children were posttested. Recognition and dictation tests were given to each class simultaneously. The children were tested individually on a performance measure. Results of the testing indicated that the word and Gordon methods were more effective than the Kodaly method in improving recognition skills.

Colley (1987) stated three factors influenced effectiveness of the three syllabic recitation systems used in this study. Children could recall words and phrases as intact units more easily than they could recall groups of nonsense syllables. A reference point for metrical stress contributed to the effectiveness of the method. Only Kodaly did not provide this. A differentiation between duple and triple subdivision of the beat was important.

Colley (1987) observes that research is needed to determine a hierarchy of rhythm patterns in terms of their difficulty and then merge this knowledge with our knowledge of children's motor and cognitive development. Many rhythm notation curricula are based on the idea that children will readily read what they can perform by rote. Colley (1987) concludes that few, if any of these curricula
are empirically based to verify teaching strategies in terms of improving rhythmic literacy.

Shehan (1987) investigated the effect of aural and visual approaches on rhythm reading and short-term retention. Second and sixth graders were asked to learn a series of four eight-beat patterns. Four modes of presentation of rhythmic patterns were tested. In the audio-rhythm mode, the rhythm was played on a woodblock. In the audio-mnemonics mode, the rhythm was presented on syllables. In the audio-visual mode, the rhythm was played on woodblock while the subject viewed the notation. The audio-visual-mnemonics mode combined notation and vocalization of the pattern. Each subject was tested individually in a single, fifteen minute session. Each pattern was presented to the subjects up to a limit of ten times, until they could accurately perform the pattern.

Results of this study indicated that aurally presented patterns require more learning trials. The addition of mnemonic syllables decreased the number of learning trials in the aural and visual modes, although the statistical significance was evidenced only in the difference between the audio-rhythm and audio-mnemonics
modes. Younger children needed more time to learn the patterns regardless of the mode of presentation.

Shehan (1987) concludes that a blending of visual and aural strategies may be most effective when teaching rhythm patterns to beginning musicians. Maturation is a factor when planning rhythm activities for the classroom. When planning these activities for primary grades, more activities over a longer time is indicated.

Major (1977) investigated the effect of the subdivision approach on improving the rhythmic performance in a high school mixed choir. Performance variables chosen for evaluation were rhythmic accuracy, maintenance of a steady pulse and maintenance of a steady pulse by an outside source, the choral conductor. Treatment groups were divided into subdivision group, imitation group and control group. A rhythm booklet was used in the subdivision and imitation groups. In the subdivision group, the conductor maintained a steady beat visually and aurally during rhythm practice. Each rhythm was counted and subdivided notationally. The choir clapped, tapped or sang underlying subdivisions while the conductor performed written patterns, then the procedure was reversed. During the final portion of the ten
week study, the subdivision process was internalized. In the imitation group, the conductor gave the pulse and performed the rhythm pattern for the choir, and they modelled the performance. The control group had no special rhythmic training.

Major (1977) concluded that the rhythmic subdivision instruction was superior to rote and imitation procedures. The subdivision group performed notated rhythmic patterns at a higher level, and demonstrated a more uniformly spaced pulse when the tempo was given by the conductor. The subdivision method was effective at fast and slow tempi. Major (1977) stated that most of the subjects who performed well on the posttest used analytical, subdivision procedures, and observed that rote teaching strategies may be of limited value.

To summarize the research on rhythmic performance and instruction the following conclusions are supported. Rhythmic training can be effective in enhancing rhythmic performance. This training should be related to the abilities of the learners. A combination of visual, aural and oral presentation of rhythmic patterns enhances the learning and retention of those patterns. In conclusion, rhythmic ability is affected by maturation.
Tonal Patterns and Melody. The ability to perform rhythm patterns is one of the skills required for reading music in a choir. The addition of tonal patterns and melodic line bring another dimension to the music reading experience. In this section, studies concerning tonal patterns, their performance and instruction, and the conservation of tonal and rhythmic patterns and their performance will be reviewed.

Sinor (1985) investigated the difficulty levels of forty-eight, four note tonal patterns measured by the echo-singing of preschool children. The patterns represented typical motives in children's songs with a variety of contours, ranges, pitch sets and linear textures. All of the patterns were within the range of d4 to b4. Twelve randomly ordered item were modelled for the children on a neutral syllable. The children sang their responses into a tape recorder. All patterns were notated on quarter notes.

Following the evaluative measures in this study, Sinor (1985) made the following conclusions. Half-steps were not difficult for young children to sing. Large intervals were more difficult to sing. Of the ten easiest test items, four had stepwise movement, and the others had no interval larger than a major third. The ten most
difficult items had descending major sixths, ascending minor sixths, and a descending augmented fourth.

Sinor (1985) stated the hypothesis that descending patterns are more easily sung than ascending patterns had limited support in this study. Three of the ten easiest patterns were descending and two were a combination of descending-ascending-descending. This contour accounted for significant variance in scores, and is found in more difficult items in all rankings. The hypothesis that successive leaps in the same direction are difficult to sing was not supported in this study.

Jarjisian (1981) investigated the effect of pentatonic and diatonic melodic instruction, socioeconomic status, and musical aptitude on rote-singing achievement of first grade children. All of the children were pretested and randomly assigned to one of three pitch pattern treatments: diatonic, pentatonic and a combination of both. All groups learned the same song materials each week during the four month treatment phase of the study. Two diatonic and two pentatonic songs were taught to all children during the third month of treatment and used as evaluative measures. Following treatment all children were posttested singing the four songs without accompaniment.
Results of the study indicated that students, regardless of tonal aptitude, teacher, school environment, or socioeconomic status, who received both diatonic and pentatonic pitch pattern instruction scored higher on performance ratings of the Do-pentatonic, La-pentatonic, harmonic minor and major songs. Students with high tonal aptitude performed better than those with low tonal aptitude, regardless of the above mentioned factors.

Jarjisian (1981) concludes that diatonic and pentatonic pattern instruction benefits young children’s rote-singing achievement. Children at any tonal aptitude level can benefit from instruction which includes a combination of pentatonic and diatonic patterns.

Feierabend (1984) investigated the effect of specific tonal pattern training on the singing abilities of first grade children. All of the children were given a listening and singing pretest, and a seven week treatment followed. Three classes were the experimental groups. The children echoed tonal patterns daily for seven weeks. Tonal patterns in group one were easy to aurally discriminate and varied in difficulty. Tonal patterns for group two were easy to sing, difficult to aurally discriminate. Tonal patterns for group three were easy to sing and aurally discriminate. Group
four received no special treatment. The results of this study showed no significant differences among the four groups on singing and/or aural discrimination abilities of first graders. All groups improved from pre to posttest measures.

Foley (1975) investigated the effect of a training program in conservation of tonal and rhythmic patterns on second graders. He defined conservation in music as the ability of a listener to realize that aspects of a musical thought can remain constant while others are being altered. To limit the scope of the study, the training program was limited to conservation in two areas, of tonal patterns with changing rhythm patterns and of rhythm patterns with changing tonal patterns. Foley (1975) designed the training program based on methods that were found to improve conservation in other areas than music.

Six classes of second graders were the subjects in this study. All were randomly assigned to experimental and control groups. Half of the children in each class were given a conservation pretest. On six consecutive days the experimental group had ten minutes of conservation training during their twenty minute music classes. The training program in this study included a variety of musical experiences to appeal to the children's aural and visual senses.
and they orally performed the patterns as well. The concept of conservation was explained and practiced in the classroom. Following treatment, all children who had not taken the pretest, took the test as a posttest. A delayed posttest was given to evaluate retention of conservation by all those taking the pretest.

Following analysis of the pre and posttest data of the experimental group, results indicated that scores on the posttest were significantly higher than on the pretest. An analysis of the pre and posttest scores of the control groups indicated no significant difference between the pre and posttest scores. There were no significant differences in conservation scores among the three classes forming the control group. Results of the Foley (1975) study indicated that both groups increased conservation ability from pre to posttesting, though gain for the control group was not significant. This study concluded that conservation of tonal and rhythmic patterns can be improved with training.

Webster and Zimmerman (1983) investigated the conservation of rhythmic and tonal patterns of second through sixth grade children. They attempted to answer:
1. Are there learning plateaus in second through sixth grades when tonal and rhythmic conservation are evaluated separately?

2. Do children score significantly better on tonal conservation tasks compared to rhythmic conservation tasks?

3. What would result if three formats for rhythmic and tonal conservation tasks were used, graphic, traditional and no notation?

4. What effect would the use of minor and pentatonic items have on scores?

5. What effect does gender have on results?

6. What effect do duple, triple and compound meters have on results?

All of the children in the study were tested twice during two music classes within a week. The format used was a game that allowed for the collection of data. The following conclusions based on results of this study were summarized by Webster and Zimmerman (1983):

1. The ability to conserve tonal and rhythmic patterns could be thought of a linear process.

2. Tonal conservation was an easier task than rhythmic conservation.
3. Graphic and traditional notation were significant aids to tonal and rhythmic conservation.

4. Test order affected rhythmic conservation by grade level but not tonal conservation.

5. Gender analysis showed a slight, superiority of girls over boys in grades three through six in tonal conservation tasks, however, this result was interactive with grade level due to sample perturbation.

6. Minor mode items seemed to enhance rhythmic perception.

7. In tonal conservation tasks, pentatonic items proved most difficult.

8. Triple meter items were easiest for tonal conservation tasks and most difficult for rhythmic conservation tasks.

Grutzmacher (1987) investigated the relationship of tonal pattern instruction that used harmonization and vocalization to tonal concept development and performance achievement of beginning band students. The research was limited to melodic music sight reading achievement, aural perception of tonal patterns in major and minor modes, and the reading recognition of major and minor patterns as they were aurally and visually perceived. The subjects in this study were fifth and sixth grade instrumental
students. The students played brass and woodwinds and were pretested and randomly assigned to two treatment groups. The groups each met for thirty minutes per week over a fourteen week period. In the experimental group, the instructional content included a set of tonal patterns taught through vocalization and other harmonization techniques. The control group did not study sets of tonal patterns using vocalization and harmonization techniques. Instead, the content was a set of musical symbols and a range of notes, emphasizing technical skill development.

The results of the Grutzmacher (1987) study indicate that instruction using tonal pattern content presented through vocalization and harmonization activities improves sight reading skills of beginning band students more than a traditional approach where notes are simply identified. A program of instruction where major and minor tonalities are experienced by students with singing, playing, listening, and comparing these patterns separately and within the context of a song, leads to a higher level of conceptual understanding than the use of definitions and descriptors to teach major and minor. A study of the correlations between music aptitude and music achievement in perception of modes indicates that instruction using tonal patterns in combination with
vocalization and harmonization is a more efficient means to develop students' tonal abilities and translate aptitude into achievement than traditional instruction where notes are simply identified.

To summarize the literature reviewed on tonal patterns, several conclusions can be stated. Successive leaps in one direction are not difficult. The ascending-descending-ascending contour is more difficult for children to sing. Diatonic and pentatonic instruction is valuable to children's musical training. Instruction may enhance the conservation of tonal patterns and lead children to the skill of music reading.

**Scale Direction and Interval Direction.** Musical scales and intervals move directionally, ascending and descending. The following studies investigate the accuracy of performance of scales and intervals with direction as a variable.

Madsen (1966) completed research to determine if there were any significant differences in intonation of unaccompanied solo vocal performances with regard to scale direction and if there were any consistent patterns of intonational differences among the individual performers or groups being investigated. The populations represented in this study were elementary students, high school
students, vocal undergraduate music majors, piano undergraduate 
music majors and violin undergraduate music majors. Subjects 
were randomly assigned to various test conditions which varied 
the performance direction of the C major and D major scales. 

The results of the Madsen (1966) study indicated the subjects 
sang the descending scale with greater accuracy. Practice did 
not have an affect on the accuracy of the performance of the scales. 
There was a slight trend for ascending scales to improve with 
practice and descending scales to become less accurate. 
Differences in scores did exist between pre-college groups and 
college groups with musical training. Piano and violin majors sang 
with as much accuracy as vocal majors. 

Some of the interesting findings in this study in addition 
to those mentioned include the following. Elementary children 
performed ascending scales better than college vocal majors did. 
One subject who was a "non-singer" performed the C major scale 
almost perfectly. The five subjects with "perfect pitch" exhibited 
the greatest differences in performance of scale direction and 
intonation. They also did not conform to the equi-tempered 
standard.
Madsen (1966) concludes the study with an explanation of the directional difference in scale performance. There might be a difference in aural perception of melodic lines with reference to direction. The neuro-muscular reproduction of the conceptualized pitch may be dependent on physical factors which are related to melodic direction. Further research is needed to explain this phenomenon.

Edmondson (1972) completed an investigation on the effect of interval direction on pitch acuity in unaccompanied solo vocal performance. This study was very similar to the Madsen (1966) study. In both studies scales were performed vocally in ascending and descending directions. Edmondson (1972) also used the same design as the earlier study. The four groups received written instructions in this study instead of practice sessions that Madsen (1966) used in his study.

The results of the Edmondson (1972) study can be compared and contrasted to those in the Madsen (1966) study. In both studies no consistent patterns of intonational differences among individual subjects or groups were indicated. Subjects with "perfect pitch" were not the most accurate performers in either study and had differences in performance that were similar to the other subjects
in the study. Edmondson (1972) found that ascending scales were more accurately performed, in direct contrast to Madsen (1966). The vocalists performed more accurately in the Edmondson (1972) study, though the Madsen (1966) study found no significant difference in intonation between vocal and instrumental groups.

Edmondson (1972) cautioned against generalization in studies that have researched performance with a directional variable. These studies have been restricted in scope and unique in design. Replication of these studies and more research into tonal and rhythmic stimuli and performance may provide a stronger research base for resolving conflicting results.

Music Reading as an Integrated Process. Students learn to combine rhythms and tonal patterns and phrases as they learn to read music. The entire process is complex, and hopefully leads to the ability to learn and perform music independently.

Boisen (1981) completed an investigation on the effect of melodic context on students' aural perception of rhythm. He stated that rhythm reading error is an important cause of music reading error. He also stated that rhythm reading errors may be caused by a discrepancy between teaching pitch sequence and rhythm, the two elements of a melody.
In this study seventh, ninth and eleventh grade students were given a test based on rhythmic units, half of the units were complete and the other half were incomplete. Students heard each unit on one pitch, as part of a melody in which completeness or incompleteness of the pitch sequence matched that of the rhythm, and as part of a melody. In each instance, the students had to answer whether the unit was complete or incomplete.

The results of this study showed that melodic context does affect perception of rhythmic completeness and incompleteness. Boisen (1981) concluded that students grouped sounds subjectively, rather than by measures. Students were able to indicate whether each group was complete or incomplete with some accuracy. Therefore, Boisen (1981) stated that students' perception was musical rather than mathematical in responding to rhythms.

MacKnight (1975) researched, developed and tested teaching techniques and materials that would treat music reading as a process and emphasize the structure of the melodic line. Fourth grade wind instrumentalists were the subjects in this study and control and experimental groups received treatment for one year. The only variation in this treatment was the method of introducing pitches. In this study, the experimental group learned each tonal
pattern in three steps. The pattern was presented aurally, then combining the aural-visual modes. Then the pattern was presented through the aural-visual mode within a musical phrase. In the control group, the pitches were introduced by letter name, fingering and sound.

Rhythms were presented to the experimental group in phrases. The rhythms were chanted on "ta" for the quarter notes, and "ti" for eighth notes, and "ta-i" for dotted quarter notes. In the control group, each note was presented rhythmically as indicated in a standard method book, as it related to beat.

Results of the MacKnight (1975) study suggest that melodic training based on audio-visual recognition of tonal patterns is effective for teaching beginning instrumentalists the meaning of notation. The data presented indicates musical understanding and proficiency on an instrument can be achieved when instruction emphasizes identification of musical patterns, active listening, and singing with tonal syllables. Chanting with rhythm syllables, thought conceptualization, and preorganized reading materials that introduce tones and rhythms in their most frequent patterns are also effective teaching strategies.
Bobbitt (1970) was also concerned with music reading as a process and stated that not enough was being done to develop techniques for teaching music reading efficiently in large mixed groups of children in elementary and secondary school settings. He devised a programmed instructional sequence to teach music reading skills to fifth grade elementary students. The program was in place for one semester, and students were instructed once a week for thirty-five minutes.

Students performed five tasks each class period. Each task took about five minutes. In task one, an aural stimulus was given and the children responded in unison. Task two required the children to visually identify notation presented on slides. In task three, rhythm and pitch drills were presented on slides, and the children responded in unison and in two parts. Rhythm and pitch dictation exercises were presented on slides for task four. Task five required the children to respond to stylized hand signals and consisted of intonation exercises in unison and two parts.

In the summary of the study, Bobbitt (1970) states that students must participate in the expression and perception of the sounds and symbols of musical communication. There are several premises crucial to the programmed instruction outlined in this
study. Teaching aids should be developed to handle large groups. Instruction should be organized into small, sequential steps. Repetition and practice will help reinforce music learning. Bobbitt (1970) also concludes that the first and most important musical skill a child should have is the ability to read music by use of the voice.

Bobbitt (1970) did not support his study with statistical analysis. He did state that fifth grade children, previously unable to recognize intervals, were able to identify and sing octaves, perfect fourths and major and minor thirds following instruction. The children were also able to combine intervals in a melodic situation and recognize their structure in a two-part framework.

Klemish (1970) agreed with Bobbitt (1970) that music reading is a complex process. She designed an experiment to determine the relative effectiveness of two methods of teaching music reading to first grade children. Following a pretest, group one melodic instruction included practice in aural discrimination and the use of pseudo-notation (lines, dashes) to visually represent patterns. Following the use of pseudo-notation, the children were introduced to conventional notation. In group two, the children began melodic instruction using conventional notation.
The results of this study indicated that first grade children can gain proficiency in music reading. The quality of the response in singing notated patterns was found to be dependent on the control of the singing voice as well as the understanding of the music symbols. The more practice on the pattern, the higher the score. Item difficulty was affected by change of direction, difficult intervals, and the amount of deviation from the tonic. Diatonic progression toward the tonic was the easiest, followed by scale movement away from the tonic. Intervals with previously heard tones were easier than those with unfamiliar tones. In dictation, patterns were more accurately reproduced if they began on the tonic.

The effect of one method over the other in this study was not significant. However, differences between groups show some skills to be better developed by one method rather than the other. Identification of melodic direction, aural matching, aural/visual matching and singing patterns seemed to be positively affected by the method using pseudo-notation, then traditional notation. Recognition of patterns, writing tones dictated from the piano and dictated by numbers, and visual matching were positively affected by the initial use of conventional notation.
Music reading studies have varied in their approach to the investigation of the various aspects of the music reading experience and in the focus of instruction to develop music reading skills. Music reading skills can be enhanced by training. A combination of audio/visual approaches have been investigated and proven somewhat effective in building music reading skills.

Transfer of Training

Definition. Transfer of learning or transfer of training has been defined as the influence of prior learning on performance in a new situation (Ellis, 1979).

Transfer of training can be defined as positive transfer, negative transfer, or zero transfer. Positive transfer is a term indicating that prior learning facilitates subsequent performance. For example, a person masters an easy task, then moves on to a more difficult one. Negative transfer occurs when prior learning interferes with new learning. And zero transfer indicates no effect of prior learning on new learning. This can be the result of combined effects of positive and negative transfer cancelling each other (Ellis, 1979).
Several categories of transfer have been labelled and defined. Specific transfer of training describes the process of applying learned tasks to another highly similar learning task (Bruner, 1960; Ellis, 1979; Goulet, 1970). Specific transfer is an example of the extension of habits and associations. Its utility can be seen in the learning of skills. The effects of specific transfer can be positive or negative in direction and are dependent on the degree of similarity between what has been learned earlier to the materials and associations in the task to be learned. Ellis (1979) uses the paradigm AB-CB to relate a source of positive transfer.

Other psychologists define specific transfer using different terminology. Perkins and Salomon (1988) use the term near transfer. Gagne and White (1978) and Joyce and Showers (1981) use the term vertical transfer. They indicate that this is a cognitive process and previously learned rules combine with other rules to arrive at a solution to a problem. Skills and ability acquired in performing one task facilitate the knowledge and learning in higher order tasks.

Nonspecific transfer is transfer of principles and attitudes. It is not a skill but a general idea which can be used as a basis for recognizing future problems as special cases of the idea first
 mastered (Bruner, 1960). Nonspecific transfer is the core of the educational process and involves building knowledge in terms of basic and general ideas. It is a source of positive transfer independent of the particular association or discrimination required on the tasks in question. It is referred to as lateral transfer by many psychologists (Gagne and White, 1978; Goulet, 1970; Joyce and Showers 1981). Perkins and Salomon (1988) refer to nonspecific transfer as high road transfer and describe it as deliberate, mindful abstraction of skill or knowledge from one context for application in another. It can be forward reaching as materials are abstracted for application elsewhere. And it can be backward reaching, a problem is analyzed and solutions are found for problems in past experience.

Instructional Implications When Teaching For Transfer.

Educators and psychologists have discussed the application of principles of transfer to instructional design. Research studies have investigated transfer of training. Some of these studies will be reviewed in the literature that follows.

Bruner (1971) concludes that the problem of how to teach children so that they will generalize breaks down into six problems. The first problem is attitude and encouraging the student to
recognize learned material as a means to solve problems.
Compatibility is next. The learner must make material his own and use it in a way to fit with what he knows already. Activation is necessary. The child must be able to solve problems and feel rewarded for the exercise of thinking. Practice in skills related to the use of information and problem solving is important. There can be a self-loop problem if a child can solve the problem but not convert it to a form that is useable for him to remember. Finally, information must be manageable so that the child can use it in problem solving.

Ellis (1979) offers practical applications to the teaching-learning process. For positive transfer, the task conditions need to be varied in the practice context. Transfer is more likely if tasks in a series are sequenced from easy to more difficult. Each task must be mastered before proceeding to the next one. Task similarity facilitates transfer. Learning and testing conditions should be similar.

Joyce and Showers (1981) agree with Ellis (1979) on several key issues and add some of their own. Training and test conditions should be similar to aid transfer. Practice is important to learning the initial tasks in a series. Task variety during original learning
enhances transfer. Understanding general rules and principles appropriate to solving new problems leads to transfer. Coaching, observation and feedback cycle directed toward the learner during instruction help assure vertical transfer.

Gelsheiser (1986) states that several aspects of instruction are critical if generalization is to occur. Students must understand goals of the tasks if their application to a new task is to occur. Payne (1982) agrees that method and result must be convincing to the student. If the goal of the instruction is the use of a skill on a variety of tasks, students should be told this. They need to develop a concept of the class of tasks where a strategy can be applied. Students are more likely to transfer if they discover for themselves concepts, patterns, regularities and invariables in a task. In conclusion Gelsheiser (1986) states teachers must build generalization into instruction to improve transfer.

Studies of Transfer in Music Education. Some transfer studies have been completed in music education. Comments on those studies follow.

Sadek (1985) wrote a general study on the transferability of music learning. Sadek (1985) urged researchers to undertake transfer studies in music learning, the domain of transfer effects
within and between musical areas. He further concluded these studies can take place in a laboratory setting or in the classroom.

Ten Eyck (1985) investigated the effects of programmed materials on the vocal development of selected children's choruses. This study used a series of programmed materials to be internalized by teachers before they rehearsed their respective choirs. Ten Eyck (1985) concluded that future research might be directed toward transfer of knowledge from teacher to student.

Olson (1978) completed a study to determine if children learn better musically if taught in an aural to visual perception order. Results failed to support presentation in either perception order.

Two other studies have been completed by Shehan (1985) and Botvin (1974). Shehan (1985) concluded a transfer study of preference from taught to untaught pieces of non-western music genres. Her study did not evidence transfer of learning. Botvin (1974) completed a study to test two procedures for facilitating the development of conservation that could be easily adapted to the classroom. The study would have implications for cognitive and musical development. The technique used was successive approximation and this was applied to teach conservation of
Then Botvin (1974) listed the effect of coupling the successive approximation procedure with verbal rule instruction. Results demonstrated the efficacy of a successive approximation paradigm to induce conservation of melody and also a genuine comprehension of the concept of conservation. He observed that there would seem to be a kinship between musical development and cognitive development.

Transfer is an important goal of the educational experience. In the planning and implementation of music experiences for elementary children, learning experiences can be structured to facilitate transfer. Perhaps instructional design can facilitate children learning to read music in the elementary children's choir. Learned rhythmic and melodic patterns may transfer to performance and sight reading in an elementary children's choir.
CHAPTER III
METHODOLOGY

Introduction

The major purpose of this study was to investigate the transfer of learned rhythmic and melodic patterns to performance and sightreading in an elementary school children's choir.

Included in this chapter is a description of (a) the subjects, (b) the independent variable and instructional procedures, and (c) the dependent measures and testing procedures.

Subjects

Sixty-five fourth and fifth graders enrolled in elementary choirs in two public schools served as subjects. One choir had a membership of twenty-five children, eleven fourth graders and fourteen fifth graders. The other choir had forty members, fifteen fourth graders and twenty-five fifth graders.
The schools chosen for this study had a student population representative of various socioeconomic and ethnic backgrounds. In both of the schools, children received music once a week for thirty minutes from an experienced general music specialist. Choir was an addition to the regular music class and was a thirty to forty minute period per week.

The membership of both elementary school choirs represented a group of children who were screened by the regular general music teacher at the beginning of the school year. Both of the music specialists asked for volunteer singers, and then checked the range and quality of the singing voices. No child was excluded from choir as a result of this general screening.

For the instructional treatment in this study, both choirs met for twenty-five to thirty minute sessions twice a week. Treatment was randomly assigned to the groups. Both of the choirs used identical choral repertoire for rehearsal, performance and evaluation.
Independent Variable and Instructional Procedures

The rehearsal in both choral groups included pedagogical instruction in posture, breathing, diction, intonation, projection and choral tone quality. Relaxation and posture exercises, choral warm-ups, voice building techniques and methodology were obtained from standard voice study texts and materials, and from children's choral texts and references (Bartle, 1988; Christy, 1970; Ehmann and Haaseman, 1981; Herman, 1988; Miller, 1986; Rao, 1987; Swears, 1985).

The choral literature and materials for both groups were chosen from select children's choral music octavos, and from a collection of children's songs. Vocal ranges approximated those recommended in previous research (cf. review of literature). A list of the seven songs that were used in this study and the order which they were presented to both groups for rehearsal appears in Appendix A.

Instruction in both groups was implemented in a positive learning environment. A ratio of positive comments to total comments was targeted at eighty percent for each session in both choirs.
Both choirs began each session with five minutes of choral warm-ups. The activities included relaxation exercises, postural warm-ups, breathing exercises, and vocalises as described in Appendix B. All choral sessions concluded with the performance of a song. This procedure was followed for both groups. Piano accompaniment was provided as appropriate to the literature performed.

Choir instruction began concurrently for both treatment groups in this study. Choir was scheduled for two twenty-five to thirty minute sessions per week at each school. As the children came into the classroom, they were given an envelope including all of the music for the study. The children were told that for each session they attended, a sticker would be placed beside their names on the chart. At the end of the instruction, special choir awards would be presented to members with regular attendance. The purpose of the attendance record was to confirm that all subjects received treatment.

Children enrolled in the two choirs received differential instruction during the course of the study. Subjects in group one learned a series of short rhythmic and melodic patterns. These learned patterns were then placed into the choral literature to be
learned for group performance. Subjects in group two learned the rhythmic and melodic patterns within the context of the songs during group rehearsal and performance.

There were eighteen instructional sessions for both choirs. All instructional treatment was videotaped using a camcorder (Minolta Master, Series V-11), mounted in a fixed position on a video-photo tripod (Slik, Model 503 QF).

The students in the two treatment groups received identical instruction except for the independent variable in this study. New song literature with new rhythmic and melodic patterns was introduced in the first instructional session each week. During the second instructional session each week, song materials used in session one were reviewed. The review and introduction of new songs was staggered so that new songs were introduced the first session of the week and then reviewed during the next three sessions. After the third review session, the song was dropped from formal instructional treatment of rhythmic and melodic patterns. All of the songs were reviewed during the final two instructional sessions.
Both choirs began each session with choral warm-ups for a period of five minutes. Following warm-ups, subjects in group one engaged in group rehearsal and evaluation of the rhythmic and melodic patterns present in music that was to follow in rehearsal. First, the new rhythmic pattern was presented to the choir on a large flashcard. The rhythmic pattern was placed on a one line staff with the meter signature indicated. The pattern was modelled for the choir by the investigator using Kodaly rhythm syllables. The choir was asked to repeat the pattern. This process was followed for up to six repetitions, until the choir could model the rhythmic pattern aloud correctly on Kodaly syllables.

Next, the rhythmic pattern was combined with a tonal pattern into a melodic pattern. The melodic pattern was presented to the choir on a five line staff with the clef sign, key signature and meter signature indicated on a large flashcard. The new melodic pattern was modelled three times by the investigator on the syllable "loo." After each vocal model, the choir was asked to sing the melodic pattern on "loo." Then the melodic pattern was modelled three times using solfege syllables. After each vocal model, the choir was asked to sing the pattern using solfege syllables.
Following rehearsal of new rhythmic and melodic patterns, subjects in group one were asked to find the patterns in the song presented for choral rehearsal. The students were directed to visually identify the pattern and vocally reproduce it. The students were asked to sing the melodic pattern once on "loo" and then on solfege syllables. This sequence was repeated at least twice.

Next, group one sang through the song in sections. Phrases were modelled for the subjects and they were asked to sing in response. The vocal modelling and singing were completed using the piano to outline pitches as needed. Following the steps outlined, the entire song was performed with piano accompaniment. This set of procedures was used by group one for the introduction of each new song.

As instructional sessions continued, subjects in group one reviewed song materials. The procedures used for review songs were similar to those used for new songs. The rhythmic pattern was presented on a large flashcard. The pattern was modelled three times using Kodaly rhythm syllables and the children were asked to repeat the pattern. The melodic pattern was modelled once on the syllable "loo" and the choir was asked to repeat the pattern. The melodic pattern was modelled twice using solfege
sylables and the children repeated the pattern. The children were then asked to locate the pattern in the music. The pattern was modelled once on "loo" and the children repeated it. The pattern was modelled with solfège syllables twice and the children repeated the pattern after each model. Following this rehearsal, the choir performed the song with piano accompaniment. This process was repeated for each review song.

As time was available in the remainder of the session, the group rehearsed phrasing, diction, dynamics and musical interpretation of the song materials presented. To conclude each session, group one chose a song to perform. The song was performed with piano accompaniment.

In group two, new songs were presented using the following procedures. The entire song was modelled for the choir using the text indicated in the music and the piano accompaniment. Then the song was modelled in phrases for the choir. They were asked to repeat each section or phrase after it was presented. For the following rehearsal of the song material, no special attention was drawn to rhythmic or melodic patterns for isolation and study, except as corrections were needed to perform them correctly. If mistakes were made by group two, corrections were modelled for
the children repeating the melodic passage using the text. Song rehearsal in group two centered around the performance of the materials using a rote teaching approach. A musical interpretation of song materials was emphasized. Posture, healthy vocal production, diction, phrasing and dynamics were applied to choral literature selected for study. As in group one, each instructional session ended with the singing of one song with accompaniment added as appropriate to the literature selected. The song material used by both groups in all sessions was identical.

In review sessions, group two used identical literature used in group one. However, the sessions followed a rote performance procedure. The children were asked to sing the songs with accompaniment. Musical corrections were made as needed in group two review sessions. Rhythmic and melodic patterns were not isolated for repetition and study, except to correct specific mistakes in their performance. Each review session concluded with the singing of a song with accompaniment added as appropriate to the selection.

The final two instructional sessions were used to review all songs by each group. Each group reviewed the final selection in the treatment sequence using the review procedures as outlined. Each
choir reviewed three other selections sung at earlier instructional sessions during the final sessions.

During the final two review sessions in group one, prior to the performance of each song, rhythmic and melodic patterns were reviewed. A volunteer subject was asked to model the rhythmic pattern on Kodaly rhythmic syllables. The volunteer was corrected as needed to perform the pattern correctly. The choir repeated the pattern as correctly modelled. The melodic pattern was presented and a volunteer subject was asked to model the pattern using the syllable "loo" and then using solfege syllables. Again, corrections were made as needed. The choir repeated the correct melodic pattern. These procedures were followed by the performance of the song with piano accompaniment. The steps outlined were followed for each of the three songs reviewed from previous instructional sessions.

In group two, the final two instructional sessions were also used as review. Review procedures outlined for group two were followed to practice the final song in the treatment sequence of this study. For the remaining three songs, the sequence of review was as follows. Each song was performed in its entirety. If
corrections were needed in the general interpretation of the song, they were made.

The following guidelines were used for the first sixteen instructional treatment sessions in this study in group one.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. Each new rhythm pattern was modelled on Kodaly syllables for the choir and repeated by them until correct, up to a total of six repetitions.

4. Each new melodic pattern was modelled at least six times, three times on a "loo" syllable, and three times on solfege syllables. The choir repeated the pattern each time it was presented.

5. A combination of up to six specific verbal suggestions and instances of modelling were presented as feedback to the choir to facilitate learning each new rhythmic and melodic pattern.

6. For new songs, up to three instances of visual identification and oral reproduction of rhythmic and melodic patterns were provided.
7. For review songs, the rhythmic patterns were modelled three times on Kodaly syllables. The choir repeated the pattern after each model.

8. Following visual identification of the melodic patterns in review songs, these patterns were modelled three times, once on "loo" and twice on solfege syllables. The choir repeated the pattern after each model.

9. Each session closed with the performance of an entire song.

The following guidelines were used for the final two sessions in this study in group one.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. In the final song of the treatment sequence, the rhythmic pattern was modelled three times on Kodaly rhythm syllables. The choir repeated the pattern after each model.

4. In the final song of the treatment sequence, the melodic patterns were modelled three times, once on "loo" and twice on solfege syllables. The choir repeated the pattern after each model.
5. In review songs, rhythmic and melodic patterns were modelled by volunteer subjects and repeated by the choir at least once.

6. Each session closed with the performance of an entire song.

The following guidelines were used for the first sixteen instructional treatment sessions in this study by group two.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. Each new song was introduced with the instructor modelling the entire song vocally with piano accompaniment added as appropriate to the song material.

4. Each new song was rehearsed using the rote method of instruction.

5. In new and review songs, no special attention was given to rhythmic or melodic patterns except for correction as needed in the performance context of the music.

6. Each session concluded with the performance of an entire song with piano accompaniment as appropriate.
The following guidelines were used in the final two instructional treatment sessions in group two.

1. Five minutes at the beginning of each choral session were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. In the presentation of the final song in the treatment phase of this study, the guidelines outlined above for new songs were followed.

4. In the review songs, again the procedures outlined above were followed. The children sang through the song materials with accompaniment. Musical corrections were made as needed in the overall interpretation of the song.

5. Each session concluded with the performance of a song with piano accompaniment as appropriate.

Eight rhythmic and eight tonal patterns were chosen for this study which are present throughout children's choral literature. The rhythmic patterns represented patterns present in the choral literature chosen for this study. There were seven two-measure patterns and one three-measure pattern. All rhythmic patterns were in simple duple meter. The selection of the tonal patterns was based on research that suggests patterns with smaller
intervals are more easily sung by children (Culpepper, 1961; Sinor, 1984). The patterns (see Appendix C) are found in the children's choral literature in this study. They represent ascending and descending tonal patterns in major and minor modes. The rhythmic and tonal patterns combine into melodic patterns present in the music selected for group rehearsal and performance. The rhythmic, tonal and melodic patterns and the order of presentation can be found in Appendix C.

**Dependent Measures and Testing Procedures**

A pretest and posttest were administered to all of the subjects in this study. Performance was evaluated on both tests using the rating sheet described in this section. An instrument was designed to evaluate instruction in each session of the treatment.

**Pretest and Posttest.** The pretest was an investigator designed instrument to evaluate individual performance on selected rhythmic and melodic patterns (See Appendix E).

Pretest items included eight rhythmic and five melodic patterns from the music chosen for study and performance. All test items were presented to the children on individual sets of
index cards. The children were asked to perform the rhythmic patterns on a spoken "tah" sound. Then they were asked to listen to eight beats on a metronome (J=76) and perform the patterns. The procedure was rehearsed with the children twice to confirm that they understood the directions. Next, the subjects performed the melodic patterns on the syllable "loo." The initial pitch was played on the piano, modelled vocally by the investigator on a "loo" syllable and a spoken cue was given for the children to sing.

The posttest had a format similar to the pretest (See Appendix F). Four rhythmic and four melodic patterns represented those studied during the treatment phase of this study. Four new rhythmic and four new melodic patterns were added to the posttest. These new patterns were judged by a panel of three choral conductors to be similar to those studied during instruction. Thus, the posttest consisted of eight rhythmic (four taught, four transfer) and eight melodic (four taught, four transfer) patterns.

The directions for the performance of the rhythmic patterns differed for the groups on the posttest. Group one was asked to perform the rhythmic patterns on Kodaly rhythm syllables as rehearsed in instructional sessions. Group two performed the rhythmic patterns on the spoken syllable "tah" because they had
not used Kodaly rhythm syllables during instructional treatment.

The directions for the performance of the melodic patterns was identical for both groups. Following the initial pitch played on the piano and modelled vocally by the investigator, and a spoken cue, the children sang the patterns on the syllable "loo." To assure a uniform presentation of test items, a script was used and is included in Appendix F.

**Instrumentation.** A four channel tape recorder (Tascam Ministudio, Porta Two) and four individual microphones (Tascam, PE 50) were used in pre and posttest measures. The tape equipment was checked for recording accuracy by a product specialist using a calibrated laboratory standard tape which was then input into a frequency counter. This assured that the tape apparatus was recording at an accurate rate of speed. Periodic checks of the tape equipment were made throughout the study to assure the continued accuracy of the tape recording equipment.

**Testing Procedure.** For the pre and posttest measures, the subjects were seated in groups of four at a round table. An individual directional microphone was placed in front of each subject. Each subject was instructed to hold up the right hand and place the thumb so that it touched the lips and then place the little
finger on the microphone tip, with the fingers of the hands spread only slightly apart. All recording levels were then preset for testing following a sound level check made by each subject speaking into the microphone. All recording equipment is listed in the equipment list, Appendix D.

**Evaluation of Pretest and Posttest.** Individual performances in each pre and posttest group were assessed. The rating sheet in Appendix G was used to evaluate pretest performances. The rating sheet in Appendix H was used to evaluate posttest performances. Two choral conductors evaluated individual performances on the pretest and on the posttest. Following the completion of the rating instrument described below, all evaluations were analyzed and compared for interobserver agreement.

Each rhythmic item in the pretest and posttest was listed and three numerical values were considered by the evaluators for each item. A rating of one defined a totally inaccurate rhythmic performance, with none of the note values executed with correct duration. A rating of two described an inconsistent rhythmic performance with some of the note values performed correctly, but the entire pattern was not accurately reproduced. A rating of
three indicated that the rhythmic pattern was performed with a high level of accuracy.

Each melodic item in the pretest and posttest was listed with three numerical values to be used by the evaluators. A rating of one described a totally inaccurate melodic performance with no rhythmic or tonal accuracy. A rating of two defined an inconsistent melodic performance. Some rhythmic and tonal accuracy was evident, but the entire pattern was not accurate. A rating of three indicated a melodic pattern performance that was highly accurate.

**Pilot Study.** A pilot study was completed to evaluate the pretest procedures, to check the recording equipment, and evaluate the instructional treatment. The instructional treatment was tested in an elementary children's choir rehearsal. Thirty children in grades three, four, five and six participated in the choir. Fifteen children from this group in grades four, five and six served as the subjects for the pilot study of the pretest.

The pretest was pilot tested and evaluated by two choral musicians. Based on their ratings and comments, the following conclusions were made. The subjects understood the directions provided to them in testing, and could carry out the sequence of tasks required. Instead of presenting items to the groups on
flashcards, each individual needed a set of cards with the test items clearly printed on them.

Each rhythmic and each melodic item was to be rated with a numerical rating of one, two or three. A one described an inaccurate performance. A rating of two outlined an inconsistent performance. A three rating defined an accurate performance.

Revisions were made in the evaluation of instruction. instrument to satisfy suggestions made by the judges. The rating scale needed more clearly defined criteria to assess the instructional treatment. The final instrument used to assess the instruction in the videotapes evaluated (n=21) is presented in Appendix I.
The purpose of the study was to assess the transfer of learned rhythmic and melodic patterns to performance and sightreading in an elementary children's choir. This chapter is organized into the following sections: (a) pretest rhythm and melody ratings, (b) implementation of instruction, (c) posttest rhythm and melody ratings, and (d) statistical comparisons between groups receiving differential instruction on the performance of taught versus transfer patterns.

Pretest Rhythm and Melody Ratings

All of the children were given a rhythmic and melodic pattern pretest. The eight one-measure rhythmic items on the pretest represented rhythmic patterns from the song materials to be used in the study. The randomly ordered rhythmic items were performed by the children on a spoken "tah."
A rating system was designed to evaluate the individual performances of the rhythmic and melodic patterns in the pretest and posttest. Each item was evaluated and rated on a numerical scale from one to three. A score of one represented a totally inaccurate response. A rating of two described an inconsistent performance, and a three indicated a totally correct response.

In group one, the mean rating on the rhythm pretest was 9.2 (SD=.98). In group two, the mean rating on the rhythm pretest was 8.75 (SD=.96). In both groups, all children responded correctly to rhythm item two, which consisted of a one measure pattern of quarter notes. Although group one performed with greater accuracy, a Mann-Whitney U test showed no significant difference between groups on pretest rhythm performance (z=-1.80, p=.07).

The melodic portion of the pretest included four two-measure melodic patterns and one three-measure melodic pattern taken directly from the song materials presented in this study. The children performed the melodic patterns on the syllable "loo." All children in both groups achieved a pretest score of 0% on the melodic patterns (M=5, SD=0).
Implementation of Instruction

All treatment sessions were videotaped for subsequent documentation of consistency between groups and implementation of instruction. Twenty-one of the thirty-six lessons (58%) were randomly chosen for analysis using the evaluation form shown in Appendix H. The results of the evaluation of these sessions are presented in Table 1. Similarities in positive comments to both groups were documented, as were differences in instructional treatment. Three of the twenty-one lessons were evaluated by two independent judges. The judges were in complete agreement in all categories; the reliability established was 1.0 (See Appendix J). Because the instructional treatment for both groups was implemented under carefully controlled conditions, such high interjudge reliability in documentation of instructional procedures might be expected.

Teacher Approval. The amount of teacher approval for both treatment groups was similar (Table 1, A-E). In both groups, the number of positive comments far exceeded the number of negative comments. As shown in Table 1, the mean approval to disapproval ratio was 90% for group one and 88% for group two.
The mean rate of approval, positive comments per minute, was determined based on total comments given during the sessions evaluated (n=21). For group one, the mean rate of approval was .81 comments per minute and for group two the rate was .60 comments per minute. A possible reason for this difference is that the sequenced instruction used in group one offered more opportunity for response during its implementation. In group two, rote-to note instruction was used and instruction was accomplished in larger, uninterrupted segments.

Attention to Rhythmic and Melodic Patterns. The instruction of rhythmic and melodic patterns differed in group one and group two (Table 1, F-P). During the first sixteen instructional sessions, group one learned rhythmic and melodic patterns following choral warm-up exercises. Rhythmic patterns were modelled for the children on Kodaly syllables, and they repeated the patterns (Table 1, Items F-G). The rhythmic patterns were placed into melodic patterns and modelled on the syllable "loo" and then on solfege syllables. Following each model the children echoed the patterns (Table 1, H-K).
Specific verbal suggestions were given to the children to enhance the learning of the rhythmic and melodic patterns at each session (Table 1, L). Up to six comments per session were given to reinforce the correct performance of patterns. The total instances in Table 1 represent new and review treatment sessions evaluated in this study (n=19). In the final review treatment sessions evaluated (n=2), specific verbal suggestions to enhance the learning of patterns were not part of the treatment.
Table 1

Implementation of Instruction (n=21)

<table>
<thead>
<tr>
<th>Instructional Criteria</th>
<th>Group One (Learned Patterns Group)</th>
<th>Group Two (Role-To-Note Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Mean minutes for warm-up</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>B. Positive teacher comments</td>
<td>211</td>
<td>150</td>
</tr>
<tr>
<td>C. Negative teacher comments</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>D. Mean percent of approval</td>
<td>90</td>
<td>68</td>
</tr>
<tr>
<td>E. Mean rate of approval (comments per minute)</td>
<td>.81</td>
<td>.60</td>
</tr>
<tr>
<td>F. Rhythm pattern modelled on Kodaly syllables</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>G. Students repeat rhythm pattern on Kodaly syllables</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>H. Teacher models melodic pattern on &quot;foo*&quot;</td>
<td>39</td>
<td>0</td>
</tr>
<tr>
<td>I. Students repeat melodic pattern on &quot;foo*&quot;</td>
<td>39</td>
<td>0</td>
</tr>
<tr>
<td>J. Teacher models melodic pattern on solfeges syllables</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>K. Students repeat melodic pattern on solfeges syllables</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>L. Specific verbal suggestions by teacher to aid learning patterns</td>
<td>46</td>
<td>0</td>
</tr>
<tr>
<td>M. Instances of student practice of visual identification of patterns</td>
<td>30</td>
<td>0</td>
</tr>
<tr>
<td>N. Student models rhythmic pattern on Kodaly syllables</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>O. Students repeat peer model of rhythmic pattern</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>P. Student models melodic pattern on &quot;foo*&quot; or solfeges syllables</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Q. Students repeat melodic pattern as modelled</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>R. Performance of song to close session</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>S. Mean total length of session in minutes</td>
<td>25</td>
<td>28</td>
</tr>
</tbody>
</table>
Following the presentation of patterns in group one, the children practiced finding the patterns visually in the music and they were asked to identify the patterns visually (Table 1, M). This was followed by singing the patterns within the context of the music on "loo" and on solfege syllables. When new songs were presented, the children practiced the described sequence up to three times. As review songs were presented, they practiced the sequence at least once.

During the final review sessions of the treatment, all of the song materials presented during the study were reviewed. The children in group one were asked to model the rhythmic and melodic patterns for their peers prior to the performance of the songs. They modelled the rhythmic patterns once using Kodaly rhythm syllables, and they modelled the melodic pattern once choosing either "loo" syllables or solfege syllables. Each final review session included four songs, and the sequence was repeated four times. The total instances in Table 1, N-Q, represent the two final review sessions evaluated in this study.

In group two no special attention was given to the learning of rhythmic and melodic patterns except as they occurred in performance. The rote to note approach was used in group two. In
the eighteen instructional sessions as new songs were introduced and reviewed, melodic phrases were modelled for the children using text and they repeated the vocal model. The children were corrected if they performed the music incorrectly. All rhythmic and melodic instruction was placed into the context of performance (Table 1, F-Q).

**Song Performance.** Each instructional session in both groups concluded with the performance of at least one song. The children performed the song or songs with piano accompaniment (Table 1, R).

**Length of Sessions.** The length of instructional sessions in both groups was similar. The mean length in minutes of instruction for both groups is presented (Table 1, S). The mean length of the sessions in group one was twenty-five minutes. The mean length of the sessions in group two was twenty-eight minutes.

**Statistical Comparisons Between Groups Receiving Differential Instruction on the Performance of Taught Vs. Transfer Patterns.**

A two factor repeated measures Analysis of Variance was used to compare the two groups and two types of pattern (taught, transfer) on the posttest. Group one performed significantly
better than group two on the rhythm posttest ($F(1,63)=26.57$, $p=.0001$). There was also a significant main effect on patterns, with taught rhythmic patterns performed with significantly more accuracy than transfer patterns ($F(1,63)=384.06$, $p=.0001$). Results of the analysis of variance on rhythmic patterns are shown in Table 2; group means are presented in Table 3.

A significant interaction demonstrated that the two groups did not perform evenly across the two types of rhythm patterns ($F(1,63)=56.63$, $p=.0001$). Both groups performed the taught patterns with more accuracy than transfer patterns, however, the difference was substantially greater for group one than group two (see Figure 1).

To further study the difference between groups on posttest rhythm performance, an unpaired $t$-test was performed on taught rhythm patterns. The mean rating of group one on the posttest taught rhythm patterns was 8.16 ($SD=1.28$). The mean rating for group two on posttest taught rhythm patterns was 6.15 ($SD=1.08$). Group one performed taught rhythm patterns with significantly more accuracy than did group two ($t(63)=-6.81$, $p=.0001$).
Figure 1. A Posttest Mean Comparison of Rhythmic and Melodic Taught Versus Transfer Patterns.
Table 2

Analysis of Variance - Posttest Taught vs. Transfer Rhythm Pattern Performance

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>32.802</td>
<td>32.802</td>
<td>26.573</td>
<td>.0001</td>
</tr>
<tr>
<td>Subjects with Groups</td>
<td>63</td>
<td>77.768</td>
<td>1.234</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern</td>
<td>1</td>
<td>199.392</td>
<td>199.392</td>
<td>384.062</td>
<td>.0001</td>
</tr>
<tr>
<td>Group x Pattern</td>
<td>1</td>
<td>29.400</td>
<td>29.400</td>
<td>56.630</td>
<td>.0001</td>
</tr>
<tr>
<td>Pattern X Group</td>
<td>63</td>
<td>32.707</td>
<td>.519</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3

Summary of Group Mean Rating Scores - Posttest Rhythm Pattern Performance

<table>
<thead>
<tr>
<th></th>
<th>Taught Rhythm Patterns</th>
<th>Transfer Rhythm Patterns</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group One</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>M</td>
<td>8.160</td>
<td>4.480</td>
<td>6.320</td>
</tr>
<tr>
<td>Group Two</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>M</td>
<td>6.150</td>
<td>4.425</td>
<td>5.527</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>65</td>
<td>65</td>
<td>130</td>
</tr>
<tr>
<td>M</td>
<td>6.923</td>
<td>4.446</td>
<td>5.685</td>
</tr>
</tbody>
</table>
The unpaired t-test was used to study the difference between groups on transfer rhythm patterns. The mean rating of group one on the transfer rhythm patterns was 4.48 (SD=.586). The mean rating of group two was 4.43 (SD=.675). There was no significant difference between group one and group two on the performance of transfer rhythm patterns (t(63)=-.336, p=.738).

The results of the unpaired t-tests indicated that group one learned taught rhythmic patterns better than group two. However, group one was no better than group two at transferring the reading performance to transfer rhythmic patterns which had been judged to be similar in content and complexity to taught rhythmic patterns.

A two factor repeated measures Analysis of Variance was performed to compare the two groups and types of melodic patterns. Group one performed significantly better than group two on the melodic posttest (F(1,63)=20.71, p=.0001). There was also a significant main effect on patterns, with taught melodic patterns performed with significantly more accuracy than the transfer patterns (F(1,63)=28.23, p=.0001). A significant interaction demonstrated that the two groups did not perform evenly across the two types of melodic patterns (F(1,63)=4.78, p=.032). Both
groups performed taught melodic patterns with more accuracy than transfer patterns, however, the difference was substantially greater for group one than group two (see Figure 1). Results of the analysis of variance on melodic patterns are shown in Table 4; group means are presented in Table 5.

To further study the difference between groups on posttest melodic performance, an unpaired t-test was performed on taught melodic patterns. The mean rating of group one on the posttest taught melodic patterns was 6.44 (SD=1.26). The mean rating for group two on posttest taught melodic patterns was 5.13 (SD=1.04). Group one performed taught melodic patterns with significantly greater accuracy than did group two (t(63)=-4.56, p=.0001).

The unpaired t-test was used to study the difference between groups on transfer melodic patterns. The mean rating of group one on the transfer melodic patterns was 5.2 (SD=1.12). The mean rating of group two was 4.58 (SD=.813). There was a significant difference between group one and group two on the performance of transfer melodic patterns (t(63)=-2.61, p=.011). Group one learned taught patterns better and were better able to transfer reading to new patterns.
Table 4

Analysis of Variance - Posttest Taught vs. Transfer Melody Pattern Performance

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>1</td>
<td>28.951</td>
<td>28.951</td>
<td>20.707</td>
<td>.0001</td>
</tr>
<tr>
<td>Subjects with Groups</td>
<td>63</td>
<td>88.080</td>
<td>1.398</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern</td>
<td>1</td>
<td>21.608</td>
<td>21.608</td>
<td>28.225</td>
<td>.0001</td>
</tr>
<tr>
<td>Group X Pattern</td>
<td>1</td>
<td>3.662</td>
<td>3.662</td>
<td>4.784</td>
<td>.0324</td>
</tr>
<tr>
<td>Pattern x Groups</td>
<td>63</td>
<td>48.230</td>
<td>0.766</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5

Summary of Group Mean Rating Scores - Posttest Melody Pattern Performance

<table>
<thead>
<tr>
<th></th>
<th>Taught Rhythm Patterns</th>
<th>Transfer Rhythm Patterns</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group One</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>M</td>
<td>6.440</td>
<td>5.200</td>
<td>5.820</td>
</tr>
<tr>
<td>Group Two</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>M</td>
<td>5.125</td>
<td>4.575</td>
<td>4.850</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>65</td>
<td>65</td>
<td>130</td>
</tr>
<tr>
<td>M</td>
<td>5.631</td>
<td>4.815</td>
<td>5.223</td>
</tr>
</tbody>
</table>
When the total rhythmic and melodic posttest performances of groups were compared, the following conclusions are noted:

1. Taught rhythmic and melodic patterns were performed with greater accuracy than were transfer patterns.

2. Overall, group one performed better on both rhythmic and melodic patterns than group two.

3. There was a significant interaction between group and type of pattern.

4. Group one performed with significantly greater accuracy than did group two on taught rhythmic patterns.

5. There was no significant difference between the groups in performance of transfer rhythmic patterns.

6. Group one performed both taught and transfer melodic patterns with significantly greater accuracy than did group two.
CHAPTER V

CONCLUSIONS

This study was designed to assess the transfer of learned rhythmic and melodic patterns to performance and sightreading in an elementary children's choir. This chapter is organized into (a) summary of research, (b) discussion of results and (c) recommendations.

Summary of Research

Purpose of the Study. This research was designed to assess the transfer of learned rhythmic and melodic patterns to performance and sightreading in a children's choir. The research questions included the following:

1. How well can children read rhythmic and melodic patterns in a choir prior to instruction?

2. To what degree will subjects who receive instruction in rhythmic and melodic patterns during the learning of songs be able to perform taught and transfer patterns on the posttest?
3. To what degree will subjects who do not receive specific instruction in rhythmic and melodic patterns during the learning of songs be able to perform taught and transfer patterns on the posttest?

4. Will there be a significant difference between the two groups in their performance of rhythmic and melodic patterns? Will there be a significant difference between the performance of taught versus transfer patterns? Will there be a significant interaction between groups receiving differential instruction in the performance of taught versus transfer patterns?

Pretest. All of the children in this study were given an investigator designed pretest. The pretest was designed to evaluate individual performance on selected rhythmic and melodic patterns. The children were tested in groups of four using a four-track tape recorder with individual microphones.

The pretest items included eight one-measure rhythm patterns and five melodic patterns selected from children's choral music to be used in this study. The children performed the rhythm patterns on a spoken "tah." following eight beats given on the metronome (J=76) and a spoken cue. The children performed the melodic patterns on "loo" syllables following an initial pitch
given on the piano and the investigator singing the pitch on "loo."

A rating system was used to evaluate individual performance of rhythmic and melodic patterns on the pretest and the posttest. A numerical scale was devised to assess each performance with a score of one, two or three. A score of one described a completely inaccurate performance. A rating of two described an inconsistent performance and a score of three was an accurate performance.

In group one, the mean rating on the rhythm pretest was 9.2 (SD=.98). In group two, the mean rating on the rhythm pretest was 8.75 (SD=.96). All of the children performed correctly on rhythm item two which was a one-measure pattern of quarter notes. Although group one did perform with greater accuracy on rhythm patterns, a Mann-Whitney U test showed no significant difference between groups on pretest rhythm performance (z=-1.80, p=.07).

All of the children achieved a melodic pretest score of 0% (M=5, SD=0).

Instructional Treatment. Sixty-five fourth and fifth graders enrolled in elementary choirs in two public schools served as the subjects in this study. One choir had a membership of twenty-five children, eleven fourth graders and fourteen fifth
graders. The other choir had forty members, fifteen fourth graders and twenty-five fifth graders. The elementary schools chosen for this study had a student population representative of various socioeconomic and ethnic backgrounds. The membership of the choirs represented a group of children screened by the regular music specialist at each school at the beginning of the school year. Choir was an addition to the regularly scheduled music classes at each school and met once a week for a thirty to forty minute instructional period. For the instructional treatment in this study, both choirs met for twenty-five to thirty minutes twice a week. Treatment was randomly assigned to the groups. Both groups used identical choral repertoire for rehearsal, performance and evaluation.

There were eighteen instructional sessions for both choirs. All instruction was videotaped for subsequent evaluation to document the consistency between groups and the implementation of instruction.

The children enrolled in the two choirs received differential instruction during the study. Subjects in group one learned a series of short rhythmic and melodic patterns. These learned patterns were then placed into choral literature to be learned for
group performance. Subjects in group two learned rhythmic and melodic patterns in the context of songs learned for group performance.

The students in the two treatment groups received identical instruction except for the independent variable in this study. New song literature with new rhythmic and melodic patterns was introduced in the first instructional session each week. During the second weekly session, song materials were reviewed. The introduction and review of new songs was staggered so that new songs were introduced at the first session each week and reviewed during the following three sessions. After the third review session, the song was dropped from formal treatment of rhythmic and melodic patterns. All of the songs were reviewed in the final two instructional sessions.

The following guidelines were used for the first sixteen instructional treatment sessions in this study in group one.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.
3. Each new rhythm pattern was modelled on Kodaly syllables for the choir and repeated by them until correct, up to a total of six repetitions.

4. Each new melodic pattern was modelled at least six times, three times on a "loo" syllable, and three times on solfege syllables. The choir repeated the pattern each time it was presented.

5. A combination of up to six specific verbal suggestions and instances of modelling were presented as feedback to the choir to facilitate learning each new rhythmic and melodic pattern.

6. For new songs, up to three instances of visual identification and oral reproduction of rhythmic and melodic patterns were provided.

7. For review songs, the rhythmic patterns were modelled three times on Kodaly syllables. The choir repeated the pattern after each model.

8. Following visual identification of the melodic patterns in review songs, these patterns were modelled three times, once on "loo" and twice on solfege syllables. The choir repeated the pattern after each model.
9. Each session closed with the performance of an entire song.

The following guidelines were used for the final two sessions in this study in group one.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. In the final song of the treatment sequence, the rhythmic pattern was modelled three times on Kodaly rhythm syllables. The choir repeated the pattern after each model.

4. In the final song of the treatment sequence, the melodic patterns were modelled three times, once on "loo" and twice on solfege syllables. The choir repeated the pattern after each model.

5. In review songs, rhythmic and melodic patterns were modelled by volunteer subjects and repeated by the choir at least once.

6. Each session closed with the performance of an entire song.
The following guidelines were used for the first sixteen instructional treatment sessions in this study by group two.

1. Five minutes at the beginning of each choral rehearsal were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.

3. Each new song was introduced with the instructor modelling the entire song vocally with piano accompaniment added as appropriate to the song material.

4. Each new song was rehearsed using the rote method of instruction.

5. In new and review songs, no special attention was given to rhythmic or melodic patterns except for correction as needed in the performance context of the music.

6. Each session concluded with the performance of an entire song with piano accompaniment as appropriate.

The following guidelines were used in the final two instructional treatment sessions in group two.

1. Five minutes at the beginning of each choral session were used for choral warm-ups.

2. Eighty percent of the instructor comments were positive.
3. In the presentation of the final song in the treatment phase of this study, the guidelines outlined above for new songs were followed.

4. In the review songs, again the procedures outlined above were followed. The children sang through the song materials with accompaniment. Musical corrections were made as needed in the overall interpretation of the song.

5. Each session concluded with the performance of a song with piano accompaniment as appropriate.

Eight rhythmic and eight tonal patterns were chosen for this study which are present throughout children's choral literature. The rhythmic patterns represented patterns present in the choral literature chosen for this study. They were seven two-measure patterns and one three measure pattern. All rhythmic patterns were in simple duple meter. The tonal patterns were selected based on research that suggests patterns with smaller intervals are more easily sung by children (Culpepper, 1961; Sinor, 1984). The tonal patterns were selected from the choral literature used in this study (see Appendix C).
Posttest. The posttest had a format similar to the pretest. The children were tape recorded in groups of four using a four channel tape recorder and individual microphones. The posttest included seven two-measure and one three-measure rhythmic patterns. Eight melodic patterns were used on the posttest, seven two-measure patterns and one three-measure pattern. Four rhythmic and four melodic patterns represented those studied during the treatment phase of this study. Four new rhythmic and four new melodic patterns were added to the posttest. The new patterns were judged by a panel three choral conductors to be similar to those studied during instruction. Thus, the posttest consisted of eight rhythmic (four taught, four transfer) and eight melodic (four taught, four transfer) patterns.

The directions for the performance of the rhythmic patterns differed for the groups on the posttest. Group one performed the rhythm patterns on Kodaly rhythm syllables as they had rehearsed them during treatment. Group two performed the patterns on a spoken "tah" syllable because they had not used Kodaly rhythm syllables during instructional treatment.
Both groups performed the melodic patterns on "loo" syllables. Following an initial pitch given on the piano and sung on "loo" by the investigator, the children sang the melodic patterns.

**Interjudge Reliability on Evaluation of Instruction.** All treatment sessions were videotaped for subsequent documentation of consistency between groups and implementation of instruction. Twenty-one of the thirty-six lessons (58%) were randomly chosen for analysis. Three of twenty-one lessons were evaluated by two independent judges. Similarities in positive comments to both groups were documented, as well as differences in instructional treatment. The judges were in complete agreement in all categories; the reliability established was 1.0.

The instructional treatment for both groups was implemented under carefully controlled conditions. In group one, as the sequence of instruction was accomplished, each step was verified by the instructor keeping a tally of each instructional criteria as completed during the treatment sessions. In group two, rote instruction was used. No special attention was given to rhythmic and melodic patterns, except as needed to correct their performance within the context of the music being performed.
The following instructional criteria were evaluated:

1. Minutes used for choral warm-up.
2. Positive teacher comments.
3. Negative teacher comments.
4. Rhythm pattern modelled on Kodaly syllables.
5. Students repeat rhythm pattern on Kodaly syllables.
6. Teacher models melodic pattern on "loo."
7. Students repeat melodic pattern on "loo."
8. Teacher models melodic pattern on solfege syllables.
9. Students repeat melodic pattern on solfege syllables.
10. Specific verbal suggestions by teacher to aid learning patterns.
11. Instances of student practice of visual identification of patterns.
12. Student models rhythmic pattern on Kodaly syllables.
13. Students repeat peer model of rhythmic pattern.
14. Student models melodic pattern on "loo" or solfege syllables.
15. Students repeat melodic pattern as modelled.
16. Performance of song to close session.
17. Total length of session in minutes.
The number of positive comments in both groups exceeded the number of negative comments. The mean approval to disapproval ratio was 90% for group one and 88% for group two (approvals to disapprovals).

The mean rate of approval, positive comments per minute for group one was .81 and for group two was .60. A possible reason for this difference is that the sequenced instruction used in group one offered more opportunity for response during its implementation. In group two, rote-to-note instruction was used and instruction was accomplished in larger, uninterrupted segments.

**Statistical Comparisons Between Groups Receiving Differential Treatment on the Performance of Taught Vs. Transfer Patterns.** A two factor repeated measures of Analysis of Variance was used to compare the two groups and two types of pattern (taught, transfer) on the posttest. Group one performed significantly better than group two on the rhythmic posttest ($F(1,63)=26.57, p=.0001$). There was also a significant main effect on patterns, with taught rhythmic patterns performed with significantly more accuracy than transfer patterns ($F(1,63)=384.06, p=.0001$). A significant interaction demonstrated that the two
groups did not perform evenly across the two types of rhythm patterns ($F(1,63)=56.63$, $p=.0001$). Though both groups performed taught patterns more accurately than transfer patterns, the difference was substantially greater for group one than group two.

To future study difference between groups on posttest performance, an unpaired $t$-test was performed on taught rhythm patterns. The mean rating of group one on the posttest taught rhythm patterns was 8.16 ($SD=1.28$). The mean rating for group two on posttest taught rhythm patterns was 6.15 ($SD=1.08$). Group one performed taught rhythm patterns with significantly more accuracy than group two ($t(63)=-6.81$, $p=.0001$).

The unpaired $t$-test was used to study the difference between groups on transfer rhythm patterns. The mean rating of group one on the transfer rhythm patterns was 4.48 ($SD=.586$). The mean rating of group two was 4.43 ($SD=.675$). There was no significant difference between group one and group two on the performance of transfer rhythm patterns ($t(63)=-.336$, $p=.738$).

The results of the unpaired $t$-tests indicated that group one learned taught rhythmic patterns better than group two. However, group one was no better than group two at transferring the reading performance to transfer rhythmic patterns.
A two factor repeated measures Analysis of Variance was performed on posttest performance of taught versus transfer melodic patterns. Group one performed significantly better than group two on the melodic posttest \( (F(1,63)=20.71, \ p=.0001) \). There was a significant main effect on patterns, with taught melodic patterns performed with significantly more accuracy than transfer patterns \( (F(1,63)=28.23, \ p=.0001) \). A significant interaction demonstrated that the two groups did not perform evenly across the two types of melodic patterns \( (F(1,63)=4.78, \ p=.032) \). Both groups performed taught melodic patterns with more accuracy than transfer patterns, the difference was substantially greater for group one than group two.

An unpaired t-test was performed to further study the difference between groups on posttest performance of melodic patterns. The mean rating of group one on the posttest taught melodic patterns was 6.44 \( (SD=1.26) \). The mean rating for group two on posttest taught melodic patterns was 5.13 \( (SD=1.04) \). Group one performed taught melodic patterns with significantly greater accuracy than group two \( (t(63)=-4.56, \ p=.0001) \).
The unpaired t-test was used to study the difference between groups on transfer melodic patterns. The mean rating of group one on transfer melodic patterns was 5.2 (SD=1.12). Group two had a mean rating of 4.58 (SD=.813). There was a significant difference between group one and group two on the performance of transfer melodic patterns (t(63)=-2.61, p=.011). Group one learned taught patterns better and were better able to transfer reading to new patterns.

Discussion of Results

The results of this study support the conclusion that group choral instruction may be an effective means to enhance the transfer of rhythmic and melodic patterns to performance and sightreading. Music reading skills can be practiced effectively in a children's choral context. Several studies have concluded that vocalization is a valuable strategy to improve music reading (Grutzmacher, 1987; MacKnight, 1975; Petzold, 1960). The current study lends further support to these conclusions.

Both groups in this study improved on rhythmic and melodic performance from the pretest to the posttest. The instructional treatment in both groups had a positive effect on the transfer of
rhythmic and melodic materials to performance and sightreading. Group choral training was an effective context for the improvement of music reading skills in this study.

Prior to the implementation of this study, the children in group one performed with greater accuracy on the rhythm patterns than the children in group two. However, rhythmic performance did not differ significantly between the two groups prior to the instructional treatment. All of the children could perform a series of four quarter notes accurately. The pattern was rehearsed prior to the rhythmic pretest and this was a factor in promoting its accuracy in the pretest.

Prior to instructional treatment none of the children could perform melodic patterns accurately. The children indicated they understood the directions given to them for melodic performance in the rehearsal of a melodic pattern presented prior to melodic items in the pretest. The mean rating on the pretest was a 5 for all of the children in both choirs indicating an inaccurate melodic performance.

Several teaching strategies were implemented to enhance transfer as outlined by psychologists and educators (Bruner, 1960; Ellis, 1979; Gagne and White, 1978; Gelsheiser, 1986; Joyce and
Bruner (1960) stated that encouraging a positive attitude on the part of the learner is an important strategy to enhance transfer. For that reason, a predominance of positive reinforcement was used. Positive comments far exceeded negative comments in the treatment sessions of both choirs.

Transfer is enhanced when materials are presented in the order, easier to more difficult (Ellis, 1979). The presentation of rhythmic and melodic patterns in both groups was structured from easier material to more difficult. Both choirs began the treatment singing materials with quarter note and half note rhythmic patterns. As treatment progressed, song materials included dotted rhythms and more intricate rhythmic patterns with eighth notes and sixteenth notes combined into melodic materials. Melodic material presented early in the study was stepwise and combined with simple quarter and half note patterns. As the study progressed, melodic skips and leaps were included into melodic materials combined with more intricate rhythmic patterns.

The children in both groups were corrected when they performed incorrectly on song materials. Coaching and feedback were offered to both groups and this strategy is effective in
enhancing transfer (Gelsheiser, 1986). Review enhances transfer and song materials were introduced and reviewed throughout the study. The children in both groups also had the opportunity to select songs dropped from formal treatment as the song performed at the close of each session.

All of the strategies outlined above enhance transfer. The results in this study indicate that both instructional treatments enhanced the transfer of rhythmic and melodic materials to performance and sightreading. In group one, systematic instruction in rhythmic and melodic patterns was used. In group two the rote-to-note method of teaching was implemented.

The overall posttest rhythmic and melodic performance was significantly more accurate in group one than group two following treatment. The children in group one were generally better able to transfer their knowledge of rhythmic and melodic materials to performance and sightreading. Bruner (1960) has stated that the object of learning should be to function in future learning situations. In order to achieve the generalization of rhythmic and melodic materials, systematic instruction may be an effective learning strategy.
In group one, the learning environment was structured to enhance the transfer of rhythmic and melodic patterns to performance and sightreading. A series of instructional criteria were established. The children learned rhythmic and melodic patterns prior to the performance of songs. They practiced saying rhythmic patterns on Kodaly syllables and singing melodic patterns on "lo" syllables and on solfege syllables. Then, children in group one visually identified melodic patterns in the context of the music to be performed. Payne (1982) stated that students need to develop a concept of the class of tasks where a strategy can be applied. Students will be more likely to generalize, transfer, if they discover for themselves concepts, patterns, regularities and invariables in a task. Gelsheiser (1986) agreed that teachers must build generalization into instruction to improve transfer.

The children in group one had the opportunity to practice and learn isolated rhythmic and melodic patterns and then place them into a musical context. They practiced rhythmic and melodic patterns at each treatment session using a performance format similar to one they would use in posttesting.
The systematic instruction used in group one may have been effective in improving their performance on the posttest. The significantly more accurate rhythmic and melodic pattern performance by group one on the posttest may have been the result of the strategy in which rhythmic and melodic patterns were learned prior to the introduction of the patterns into song materials.

Accurate performance of rhythmic and melodic patterns learned in the context of choral rehearsal is important to the choral performance of song literature. The systematic instruction of rhythmic and melodic patterns prior to their introduction into choral literature may be an effective instructional strategy to enhance the accurate performance of taught patterns.

Petzold (1960) concluded that accurate reading of musical notation was more likely if the emphasis was on the significance of the notation, not imitation of musical materials. He also stated that songs could be learned more effectively if tonal patterns were practiced first. He observed that if pattern study was to lead to music reading, emphasis needed to be placed on recognition and design of patterns as well as recognition of the patterns in the context of the song. In this study rhythmic and melodic patterns
were isolated, learned and placed into the context of music to be learned for choral performance. Results in the current study affirm that systematic rhythmic and melodic pattern instruction does lead to a more accurate performance of taught patterns. Given the overall superior performance of group one over group two, the significant interaction between group and pattern provided further insight into the effect of instructional treatments on performance of taught and transfer patterns.

The transfer rhythm pattern performance did not differ significantly between group one and group two. Transfer rhythmic patterns were performed with less accuracy than were taught patterns in both groups. Gordon's (1970) sequence of objectives to teach rhythm included generalization activities in which students had aural/oral practice of unfamiliar rhythmic elements. Children created and improvised rhythmic patterns. In this study, only taught rhythm patterns were isolated for systematic instruction in group one. If unfamiliar rhythmic patterns had been isolated for systematic instruction and the children had participated in rhythmic improvisation activities, a greater difference in posttest rhythm pattern performance may have
resulted between groups. Kodaly rhythm syllables were used in the instruction of rhythm patterns in group one.

Group one performed only slightly better ($M=4.48$) than group two on the transfer rhythm patterns. Colley (1987) investigated the effects of three syllabic recitation systems on improving rhythm reading in elementary children, the Gordon method, word method and Kodaly method. She concluded that children could recall words and phrases as intact units more easily than they could recall groups of nonsense syllables. Colley (1987) found the Gordon and word methods more effective than the Kodaly method in improving rhythm recognition skills. If a rhythm reading system other than Kodaly rhythm syllables had been used in the systematic rhythmic pattern instruction, perhaps transfer rhythmic performance may have differed more between group one and group two.

The significant interaction of group and pattern may have been the result of the instructional treatment. Group one performed both rhythmic and melodic patterns in the posttest with greater accuracy than did group two.
The transfer melodic patterns were performed more accurately by group one than group two. The children in group one were able to perform transfer melodic patterns with greater accuracy than in group two. Music reading is a complex process. The children in this study were asked to perform taught patterns taken directly from choral music used in this study and to sightread transfer patterns, judged similar to taught patterns. Webster and Zimmerman (1983) found that children could conserve tonal patterns more easily than they could conserve rhythmic patterns. Foley (1975) found that conservation of tonal and rhythmic patterns can be improved with training. In this study, the children were asked to perform rhythmic patterns separately from a group of melodic patterns. Results support the conclusion that rhythmic conservation may indeed be more difficult for children. Further research might be directed toward developing a more effective sequence of instruction to enhance the conservation of rhythmic materials. Rhythmic accuracy is important in any musical performance.

Petzold (1960) observed that more sessions, not longer ones would lead to a greater understanding of musical notation. Bruner (1971) concluded that students must make material their
own and use it in a way to fit with what he already knows. If the current study were extended over a longer instructional treatment period, perhaps the results would have been different. Systematic instruction in rhythmic and melodic patterns prior to their introduction into song literature may have been found to be more effective. More transfer may have occurred from taught to transfer patterns in group one.

In conclusion, group choral instruction was found to be an effective learning context in this study. The children in both elementary choirs were able to transfer rhythmic and melodic patterns to performance and sightreading. This study supports the conclusion that the children's choral experience can provide added time and opportunity to develop musical skills in the elementary school setting.

Recommendations

Transfer of training is an important objective in the planning of any educational experience. The children's choir can be the context in which music reading skills are practiced and applied to a new situation, sightreading.
The current study was limited to a ten week period of instructional treatment. Implementing systematic rhythmic and melodic pattern instruction over a longer period may lead to broader generalization. The instructional treatment outlined in this study could be more effective in enhancing transfer of music reading skills to performance and sightreading.

The rhythmic and melodic patterns used in the instructional treatment in future studies could be expanded to include more varied patterns rhythmically and melodically. In this study duple meter was used exclusively. Both major and minor tonalities were used in the current study, however, melodic patterns in future studies could represent other modes as well.

Further research in music instruction might well include studies which explore transfer in other choral and instrumental group settings. The findings concerning transfer of music learning have important instructional implications for music education. Structuring a music learning experience for children to enhance the transfer of learned skills and concepts for application in new musical contexts is important. If musical skills and concepts can be transferred, students can become more independent musical learners.
REFERENCES


APPENDIX A

SONG LITERATURE
Song Literature


APPENDIX B

WARM-UP EXERCISES
Warm-up Exercises/Vocalises

I. Relaxation exercises
   A. Shoulder rolls
   B. Side to side body bends
   C. Five long stretches up
   D. Five long stretches down
   E. Head nods
   F. Others

II. Postural exercises
   A. Standing position
      1. Spinal stretch
      2. Shoulder rolls
      3. Stance corrector - feet slightly apart, weight evenly distributed, knees slightly flexed
      4. Arms loose at the sides of the body
      5. Head comfortably erect
   B. Seated position
      1. Backs away from seat backs, straight
      2. Use front half of the chair only
      3. Feet flat on the floor
      4. Rib cage lifted
      5. Hold the music up

III. Breathing exercises
   A. Cool air sip for a count of three, exhale on "ts" for slow count of five. Extend the exhale to counts of eight, ten
   B. Five short sniffs inhaled and blow out
   C. Inhale a "breath of surprise" and blow out five quick puffs, like blowing out candles
   D. Inhale a "breath of surprise" and exhale on short, stacatto patterns of consonants, "t," "s," "p," "ch."
   E. In a standing position, inhale a long slow breath and expel slowly on a "ts," as air runs out, sit down
IV. Vocalises

A. To unify vowel sounds and connect breath to tone, vowel sounds are sung to a descending so-do pattern.

B. This patterns are sung legato and stacatto, and pattern is moved up and down by half steps, pattern always begins one octave above middle c.

\[ \text{oo} \]
\[ \text{oh} \]
\[ \text{ah} \]
\[ \text{long a} \]
\[ \text{long e} \]
\[ \text{eh} \]
Rhythmic, Tonal and Melodic Patterns

Rhythmic Patterns

1. \( \frac{2}{2} \) 

2. \( \frac{2}{2} \) 

3. \( \frac{2}{2} \) 

4. \( \frac{4}{2} \) 

5. \( \frac{4}{4} \) 

6. \( \frac{4}{4} \) 

7. \( \frac{4}{4} \) 

8. \( \frac{4}{4} \)
Tonal patterns

1. do2-re2-mi2-do2-ti1
2. so1-mi1-re1-do1
3. do1-re1-mi1-so1-la1
4. so1-la1-ti1-do2
5. do2-so1-la1-ti1-do2
6. la-so1-fa1-mi1-re1-do1
7. mi2-re2-do2-ti1-la1
8. la1-la2-so2-fa2-mi2-la1

Melodic Patterns

1. 
   \[ \text{Staff notation} \]

2. 
   \[ \text{Staff notation} \]

3. 
   \[ \text{Staff notation} \]

4. 
   \[ \text{Staff notation} \]
EQUIPMENT LIST

Atlas Sound Microphone Stands (Model No. DS-7)
Durham Cardtable, Thirty-six Inch Diameter (Model No. 1108)
Fuji Videocassettes (HQ T-120 and HG T-120)
Korg Chromatic Digital Metronome (DTM-12)
Minolta Camcorder (Minolta Master, Series V-11)
Nakamichi Stereo Headphones (Model No. SP-7)
Slik Photo-Video Tripod (Model No. 503 QF)
Tascam Four Channel Tape Recorder (Ministudio, Porta-2)
Tascam Individual Microphones (PE-50)
PRETEST

RHYTHMIC PATTERNS:

Investigator: You each have a stack of index cards on the table in front of you. Each of the cards has a red number in the right hand corner. I will tell you when to flip each card over, so that you can see each example. And to double check, I will give you the page number in red at the bottom right hand corner. As I present these cards to you, I would like you to say the rhythmic patterns for me on a spoken "tah" sound, like this. "Tah." (In group one, the children were directed to say the patterns on rhythm syllables, "tah" or "tah-ti-ti" as we had practiced in class). Listen to the eight beats the metronome will make ($J = 76$). I will say, "One, two, ready, go" on the next four beats, and then you begin. Let's practice these steps first. (Two rehearsals were provided on the examples.)

Practice Items:

\[
\begin{align*}
\frac{4}{4} & \quad \text{or} \quad \frac{4}{4} \\
\frac{4}{4} & \quad \text{or} \quad \frac{4}{4}
\end{align*}
\]

Now, please flip the top card over so that you are looking at card number 2. Listen to eight beats, and my "one, two, ready go." Then you try to say the rhythm patterns that I am presenting to you. Please don't worry if you do not know how to say the patterns, just try to do your best.
MELODIC PATTERNS

INVESTIGATOR: As we continue, and flip to page ten, I would like you to try to sing the notes on these cards for me on the syllable "loo." I will play the starting pitch, the first note for you on the piano, and sing the note for you. Following my singing, I will say "One, two, ready sing." Then you begin. Let's practice together first a couple of times. (Two rehearsals were provided on the example.)

Practice example:

That was a great rehearsal! Now I want you to try to sing of these examples for me on the syllable "loo." If you make mistakes, it's O.K., just try to do your best.

1. 

2. 

3.
APPENDIX F

POSTTEST
POSTTEST

RHYTHMIC PATTERNS:

Investigator: You each have a stack of index cards on the table in front of you. Each of the cards has a red number in the right hand corner. I will tell you when to flip each card over, so that you can see each example. And to double check, I will give you the page number in red at the bottom right hand corner. As I present these cards to you, I would like you to say the rhythmic patterns for me on a spoken "tah" sound, like this. "Tah." (In group one, the children were directed to say the patterns on rhythm syllables, "tah" or "tah-ti-ti" as we had practiced in class). Listen to the eight beats the metronome will make (\(=76\)). I will say, "One, two, ready, go" on the next four beats, and then you begin. Let's practice these steps first. (Two rehearsals were provided on the examples.)

Practice Items:

\[
\begin{array}{c|c}
\frac{4}{4} & \frac{4}{4} \\
\end{array}
\]

Now, please flip the top card over so that you are looking at card number 2. Listen to eight beats, and my "one, two, ready go." Then you try to say the rhythm patterns that I am presenting to you. Please don't worry if you do not know how to say the patterns, just try to do your best.
MELODIC PATTERNS

INVESTIGATOR: As we continue, and flip to page ten, I would like you to try to sing the notes on these cards for me on the syllable "loo." I will play the starting pitch, the first note for you on the piano, and sing the note for you. Following my singing, I will say "One, two, ready sing." Then you begin. Let's practice together first a couple of times. (Two rehearsals were provided on the example.)

Practice example:

That was a great rehearsal! Now I want you to try to sing of these examples for me on the syllable "loo." If you make mistakes, it's O.K., just try to do your best.

1.

2.

3.
APPENDIX G

PRETEST RATING SHEET
RATING SHEET - PRETTEST

Subject Number: ______

RHYTHMIC PATTERNS:
Directions: Please place an "x" below the number which describes the performance of each of the rhythmic patterns attempted by the subject.

1 - Totally inaccurate rhythmic performance; no note values executed with correct duration.
2 - Inconsistent rhythmic performance; some note values executed with correct duration, but the entire pattern was not accurately reproduced.
3 - Performed with high level of accuracy; notes within rhythmic pattern performed accurately

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<td>8.</td>
<td>( \frac{3}{4} )</td>
<td>( p )</td>
<td>( \square )</td>
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</tbody>
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MELODIC PATTERNS:
Directions: Please place an "x" below the number which describes the performance of each of the melodic patterns attempted by the subject.

1 - Totally inaccurate melodic performance; no rhythmic or tonal accuracy.
2 - Inconsistent melodic performance; some rhythmic and tonal accuracy, but the entire melodic pattern was not accurately reproduced.
3 - Performed with a high level of accuracy; rhythmic and tonal patterns performed accurately.

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RATING SHEET - POSTTEST

Subject Number: _____

RHYTHMIC PATTERNS:
Directions: Please place an "x" below the number which describes the performance of each of the rhythmic patterns attempted by the subject.

1 - Totally inaccurate rhythmic performance; no note values executed with correct duration.

2 - Inconsistent rhythmic performance; some note values executed with correct duration, but the entire pattern was not accurately reproduced.

3 - Performed with high level of accuracy; notes within rhythmic pattern performed accurately

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MELODIC PATTERNS:
Directions: Please place an "x" below the number which describes the performance of each of the melodic patterns attempted by the subject.

1 - Totally inaccurate melodic performance; no rhythmic or tonal accuracy.
2 - Inconsistent melodic performance; some rhythmic and tonal accuracy, but the entire melodic pattern was not accurately reproduced.
3 - Performed with a high level of accuracy; rhythmic and tonal patterns performed accurately.

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<td><img src="image14.png" alt="Diagram 14" /></td>
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</table>
APPENDIX I

VALIDATION OF INSTRUCTION
VALIDATION OF INSTRUCTION

Directions: Indicate time on task (minutes) for items one and seventeen in the second column below. For the remaining items, indicate instances of occurrence.

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Minutes used for choral warm-up</td>
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<tr>
<td>2. Positive teacher comments</td>
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<td>3. Negative teacher comments</td>
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<tr>
<td>4. Teacher models rhythm patterns on Kodaly syllables</td>
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<tr>
<td>5. Students repeat rhythm patterns on Kodaly syllables</td>
<td></td>
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<tr>
<td>6. Teacher models melodic patterns on &quot;loo&quot;</td>
<td></td>
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<tr>
<td>7. Students repeat melodic patterns on &quot;loo&quot;</td>
<td></td>
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<tr>
<td>8. Teacher models melodic patterns on solfege</td>
<td></td>
</tr>
<tr>
<td>9. Students repeat melodic patterns on solfege</td>
<td></td>
</tr>
<tr>
<td>10. Specific verbal suggestions of teacher to aid learning rhythmic and melodic patterns</td>
<td></td>
</tr>
<tr>
<td>11. Instances of practice of visual or aural identification of patterns</td>
<td></td>
</tr>
<tr>
<td>12. Student models rhythmic pattern on Kodaly syllables</td>
<td></td>
</tr>
<tr>
<td>13. Students repeat rhythmic pattern on Kodaly as modelled by a student peer</td>
<td></td>
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<tr>
<td>14. Student models melodic pattern on &quot;loo&quot; or solfege</td>
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<tr>
<td>15. Students repeat melodic pattern as modelled by a student peer</td>
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<tr>
<td>16. Performance of entire song to conclude session</td>
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<tr>
<td>17. Total length of session</td>
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APPENDIX J

INTERJUDGE RELIABILITY ON EVALUATION OF INSTRUCTION
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<tr>
<th>Instructional Criteria</th>
<th>Judges Evaluation</th>
<th>Tape 1</th>
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<td>J2</td>
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<td>3. Negative teacher comments</td>
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<tr>
<td>4. Rate of approval (times per minute)</td>
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<td>.69</td>
<td>.69</td>
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<td>5. Rhythm patterns modelled on Kodaly syllables</td>
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<tr>
<td>6. Students repeat rhythm patterns on syllables</td>
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<tr>
<td>7. Teacher models melodic patterns on &quot;loo&quot;</td>
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<tr>
<td>8. Students repeat melodic patterns on &quot;loo&quot;</td>
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<tr>
<td>9. Teacher models melodic patterns on solfege syllables</td>
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<tr>
<td>10. Students repeat melodic patterns on solfege syllables</td>
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<td>11. Specific verbal suggestions by teacher to aid learning patterns</td>
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<tr>
<td>12. Instances of practice of visual or aural identification of patterns</td>
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<tr>
<td>13. Performance of entire song to close session</td>
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<tr>
<td>14. Student models rhythmic pattern on Kodaly syllables</td>
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<tr>
<td>15. Students repeat peer model of rhythmic pattern on Kodaly syllables</td>
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<tr>
<td>16. Student models melodic pattern on &quot;loo&quot; or solfege syllables</td>
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<td>17. Students repeat peer model of melodic pattern</td>
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<td>18. Total length of session</td>
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<td>29:05</td>
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