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A STUDY INVESTIGATING THE COMPARATIVE EFFECTS OF AN AUDIATION  
PAUSE IN TONAL PATTERN TRAINING ON FOURTH AND FIFTH GRADE  
CHILDREN

By  
Melodey A. Kleva-Forchic

A Thesis

Submitted in partial fulfillment of the requirements of the  
MA: Master in Music Education  
of  
The Graduate School  
At Rowan University

Approved

Date Approved: 4/13/05

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## Abstract

Melodey Kleva-Forchic

A Study Investigating The Comparative Effects Of An Audiation Pause In Tonal  
Pattern Training On Fourth And Fifth Grade Children.

2005

Thesis Advisor: Dr. Lili M. Levinowitz

Master of Arts: Music Education

Graduate Division of Rowan University

The purpose of this study is to examine variations of response time in tonal pattern training. The problem of the study is twofold. 1) To determine the comparative effect of fourth and fifth grade students who echoed tonal patterns immediately and students who echoed after a pause, and 2) to examine how the variations in response time in tonal pattern training effects the performance of high and low aptitude students.

The sample for this study consisted of approximately 140 fourth and fifth grade students who attended an elementary school located in a Southern New Jersey suburban community. The sample included six intact classes, each class randomly assigned to the treatment group and the control group. All six classes received music instruction once a week for 40 minutes from the investigator.

The Intermediate Measures of Music Audiation (IMMA) was administered to all students during regularly scheduled music classes prior to the beginning of the tonal

pattern instruction to determine each student's level of musical aptitude. During the ten weeks of instruction, the subjects participated in tonal pattern training during their regularly scheduled music class singing tonic and dominant tonal patterns in major and minor, first at the aural/oral level and then at the verbal association level.

At the end of the period, students were tested individually on their singing achievement of tonal patterns. Within two weeks of the completion of the tonal training, students were tape-recorded singing familiar and unfamiliar tonal patterns on the neutral syllable "bum" in major and minor. Two judges were trained to evaluate the student performances using a criterion-referenced tonal rating scale.

The interjudge reliability between judges was calculated at .915. No statistically significant differences were found for either the interaction or main effect for the treatment. As expected, however, a main effect for aptitude was confirmed through statistical analysis. Based on the evidence acquired from this study, it cannot be concluded that variations of response time in tonal pattern training is a necessary component for learning theory pedagogy.

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## CHAPTER ONE

### Introduction and Purpose of the Study

The singing achievement of young children has been the focus of investigation throughout the history of research in music education. Much of the research has been concerned with the development of content and techniques to be used in teaching. Tonal pattern training has been a technique used by music educators to help improve student singing achievement and aural discrimination skills.<sup>1</sup> Several studies have suggested that children are more successful with melodic patterns and songs than with single tones or scales.<sup>2</sup>

One such study by Jones, found that some subjects were able to match certain pitches within a pattern but were unable to match the same pitches when they occurred as single tones.<sup>3</sup> However, not all tonal patterns are equally effective for improving student singing achievement and aural discrimination skills. Another study by Feierabend found that echoing tonal patterns that are easy to sing but are varied in aural discrimination difficulty increases the relationship between singing and listening abilities. Echoing patterns that are easy to sing regardless of aural difficulty may, however, improve students' aural discrimination abilities better than if they echoed patterns that are easy to aurally discriminate. Echoing patterns that are easy to sing but varied in aural difficulty

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<sup>1</sup> Jones, M. "A pilot study in the use of a vertically-arranged keyboard instrument with the uncertain singer." Journal of Research in Music Education. Vol. 19, #2, (1971): pp. 183-194.

<sup>2</sup> Jones, M. "A pilot study in the use of a vertically-arranged keyboard instrument with the uncertain singer." Journal of Research in Music Education. Vol. 19, #2, (1971): pp. 183-194.

<sup>3</sup> Jones, M. "A pilot study in the use of a vertically-arranged keyboard instrument with the uncertain singer." Journal of Research in Music Education. Vol. 19, #2, (1971): pp. 183-194.

tended to improve aural discrimination and echoing patterns that are easy to aurally discriminate but varied in singing difficulty tended to improve singing ability.<sup>4</sup>

A study by Catherine Jarjisian investigating the relationship between pitch pattern instruction and the singing achievement of first-grade students revealed that a group of students receiving a combination of diatonic and pentatonic pitch pattern instruction to have significantly higher performance scores than either the diatonic or pentatonic treatment groups, regardless of tonal aptitude or school environment.<sup>5</sup>

Music educators have also sought to develop the proper content sequencing of instruction to educate young children.<sup>6</sup> Sequences for content pattern instruction have been developed for several methodologies. Lowell Mason emphasized the importance of teaching sound before sign and of engaging students in practice before theory.<sup>7</sup> A quote by Michael Marks expresses this importance. "If the eye is to take meaning from the printed page of music notation, the ear must be taught first."<sup>8</sup> Emile Jaques-Dalcroze believed that tonal sense could only be developed through the ear and emphasized vocal exercises and singing. His tonal sequence begins with solfege exercises in the key of C.

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<sup>4</sup> Feierabend, John. "The Effects of Specific Tonal Pattern Training on Singing and Aural Discrimination Abilities." Diss. Temple University 1984.

<sup>5</sup> Jarjisian, Catherine S. "Pitch Pattern Instruction and the Singing Achievement of Young Children." *Psychology of Music*, 1983, vol. 11, 19-24.

<sup>6</sup> Gordon, Edwin E. *Learning Sequences in Music: Skills, Content, and Patterns*. (Chicago, Illinois: G.I.A Publications, Inc., 2004), 250.

<sup>7</sup> Schleuter, Stanley L. *A Sound Approach to Teaching Instrumentalists: An Application of Content and Learning Sequences*, 2<sup>nd</sup> ed. (New York, New York: Schirmer Books, 1997), 27.

<sup>8</sup> Mark, Michael L. *Contemporary Music Education*, 3<sup>rd</sup> ed. (New York, New York: Schirmer Books, 1996), 80.

Once the student masters this exercise, they move onto other keys.<sup>9</sup> The first melody encountered by children in the Orff approach is the falling minor third (sol-mi). New intervals are added gradually until students learn the pentatonic scale.<sup>10</sup> Similarly, Zoltan Kodaly developed a content sequence from the falling minor third (sol-mi) to the diatonic scale based on the frequency of occurrence of these patterns in the indigenous literature of the folk music in Hungary.<sup>11</sup> More recently, Edwin Gordon's Music Learning Theory developed a content sequence from major to unusual tonalities based on how children audiate. To audiate is to "hear" music and to comprehend music for which the sound may or may not be physically present.<sup>12</sup>

Gordon has further developed a skill sequence based on music learning theory. Students are taught to perform tonal patterns and rhythm patterns in learning sequence activities as the foundation for learning how to audiate which is a fundamental music learning theory skill. According to Gordon, audiation cannot be developed by only listening or by only performing. Both listening and singing are necessary for audiation potential to be reality.<sup>13</sup>

Tonal pattern or rhythm pattern instruction should be presented in the first ten minutes of each music class. It is also recommended that instruction is alternated each

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<sup>9</sup> Becknell, Arthur F. "A History of the Development of Dalcroze Eurhythmics in the United States and It's Influence on the Public School Program." Diss. University of Michigan, 1970.

<sup>10</sup> Carder, Polly. The Eclectic Curriculum in American Music Education, 2<sup>nd</sup> ed. (Reston, Virginia: Music Educators National Conference, 1990), 118.

<sup>11</sup> Choksky, Lois. The Kodaly Method Comprehensive Music Education from Infant to Adult. (Englewood, New Jersey: Prentice Hall, Inc., 1974), 9.

<sup>12</sup> Grunow, Richard F., Gordon, Edwin E., and Azzara, Christopher D. Jump Right In The Instrumental Series for Winds and Percussion. (Chicago, Illinois: G.I.A Publications, Inc., 2001), 19.

<sup>13</sup> Gordon, 2004, 91.

week between tonal and rhythm instruction.<sup>14</sup> Additionally, when presenting tonal patterns, according to Gordon, a pause must be allowed after the teacher has performed a tonal pattern and before the student echoes that tonal pattern, or they will be most likely to imitate the pattern. To ensure that students audiate the pattern, rather than imitate it, Gordon suggests a pause between the teacher singing the pattern and the students' echo.<sup>15</sup> However, in the rhythm context, a study by Colleen Farrell-McArdle failed to find statistically significant differences using the pause technique on either rhythm achievement or musical aptitude, which are both, linked to audiation.<sup>16</sup> Therefore, more research is needed to determine the necessity and efficacy of using a pause when presenting tonal pattern instruction.

The purpose of this study is to examine variations of response time in tonal pattern training. The problem of the study is twofold. 1) To determine the comparative effects of fourth and fifth grade students who echoed tonal patterns immediately and students who echoed after a pause, and 2) to examine how the variations in response time in tonal pattern training effects the performance of high and low aptitude students.

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<sup>14</sup> Gordon, 2004, 259.

<sup>15</sup> Gordon, 2004, 205.

<sup>16</sup> Farrell-McArdle, Colleen. "An Experimental Study of Audiation Time for Rhythm Pattern Instruction on the Rhythm Achievement and Developmental Rhythm Aptitude of First Grade Students." Master Thesis, Rowan University, 2004.

## CHAPTER TWO

### Related Research

#### Introduction

There is a paucity of research available supporting the audiation pause technique in presenting tonal patterns. One study examining an audiation pause for rhythm patterns by Colleen Farrell-McArdle is discussed in detail. Furthermore, two additional studies are discussed. Each has provided insight for the researcher and guided the procedures for this investigation although it is unclear if an audiation pause was utilized when presenting tonal patterns.

#### The Jarjisian Study<sup>1</sup>

The purpose of this study by Catherine S. Jarjisian was to determine the effects of diatonic and pentatonic pitch pattern instruction, socio-economic status, and musical aptitude on the rote-singing achievement of first grade children. This study also sought to determine if diatonic pitch pattern instruction should be delayed until children have a firm base in pentatonic pitch pattern instruction.

Three classes from two schools in Philadelphia, Pennsylvania for a total of six first-grade classes were chosen to participate in the study. Each school represented differences in terms of socioeconomic status, teachers and amounts of instruction time.

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<sup>1</sup> Jarjisian, Catherine S. "Pitch Pattern Instruction and the Singing Achievement of Young Children." Psychology of Music, 11 (1983), 19-24.

All students from both schools were randomly assigned into three experimental groups. Group one received diatonic pitch pattern instruction, group two received pentatonic pitch pattern instruction and group three received a combination of diatonic and pentatonic pitch pattern instruction. All patterns regardless of group were presented discretely. No chaining of patterns occurred in any of the experimental treatments.

Prior to instruction, all students were administered the tonal portion of the Primary Measures of Musical Aptitude (PMMA). For a four-month period, all students received regular music instruction including pitch pattern instruction consisting of echo singing on a neutral syllable or with syllable names in large group and individually. The remainder of the class consisted of diatonic and pentatonic criterion songs and regular rhythmic, listening, and movement activities.

At the end of the treatment period, each child was recorded singing the four criterion songs previously taught, as follows: two diatonic songs and two pentatonic songs. Two judges, using a five-point rating scale, evaluated student performances. A combined interjudge reliability for the diatonic and pentatonic songs was found to be .86.

Three-way analyses of variance were conducted at the .05 level of significance on the following factors: a) instructional treatment, b) tonal aptitude level as determined using the 50<sup>th</sup> percentile on the tonal test of PMMA and, c) school population. Separate analyses were calculated for each of the four songs, for the pairs of diatonic and pentatonic songs, and all songs together.

The results of the group receiving a combination of diatonic and pentatonic pitch pattern instruction had significantly higher performance scores than either the diatonic or

pentatonic treatment groups, regardless of tonal aptitude, socioeconomic status, teacher or amount of instruction. From these results, it is reasonable to conclude that instructional content should include both diatonic and pentatonic instruction simultaneously so that even culturally diverse children taught infrequently and/or for short periods of time can benefit.

### The Feierabend Study<sup>2</sup>

The purpose of this study by John Feierabend was to acquire information that would enable teachers to plan strategies appropriate for the instruction of first grade students. The problem of the study was to determine the relative effects of training based on tonal patterns which are easy to sing, training based on tonal patterns which are easy to aurally discriminate, or training based on tonal patterns which are both easy to sing and easy to aurally discriminate, on the development of singing and aural discrimination skills of first- grade children.

The sample used in this study consisted of four first-grade classes of boys and girls from an elementary school in suburban Philadelphia, Pennsylvania. The socio-economic status of the community ranged from lower-middle class to predominantly upper middle-class. Three classes were randomly selected to serve as the experimental groups and the fourth class served as a control group.

Prior to instruction, a teacher-made listening test and a singing test were administered to all four classes, which served as a pretest and posttest. The listening test

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<sup>2</sup> Feierabend, John. "The Effects of Specific Tonal Pattern Training on Singing and Aural Discrimination Abilities." Diss. Temple University 1984.

was administered first. This test required students to aurally discriminate between two patterns and to decide if each pair was the same or different. One week later, the singing test was administered to each student individually. Each student was recorded echoing tonal patterns.

For seven weeks, the three experimental groups received daily pattern treatment for approximately five to seven minutes in addition to their two regular general music classes, which consisted of singing songs with piano, or recorded accompaniment and movement activities. As a class, students echoed after the researcher sang two-note, three-note and four-note patterns on a neutral syllable alternating between tonic and dominant functions. Group one received patterns which were easy to perceive aurally regardless of singing difficulty. Group two received patterns which were easy to sing regardless of aural difficulty and Group three received only patterns which were both easy to sing and easy to discriminate aurally. The control group, group four, received only the two weekly general music class activities without any special pattern instruction. At the end of the experiment, the listening test and singing tests were re-administered to all classes.

To determine if any of the treatments had a significant effect on either singing or aural discrimination abilities, four one-way analyses of covariance were performed on the scores of the pretests and posttests for the listening test and singing tests. Pretest and posttest scores for the listening and singing tests were then correlated to determine which, if any, of the various treatments affected the relationship between singing ability and aural discrimination abilities.



The results indicated that not one of the treatments has a significant effect on singing and/or aural discrimination abilities of first grade students. Changes in the mean scores and changes in the correlations between singing and listening test scores, however, do suggest that echoing tonal patterns that are easy to sing but are varied in aural difficulty tend to improve aural discrimination and echoing patterns that are easy to aurally discriminate, but varied in singing difficulty tend to improve singing ability.

### The Farrell-McArdle Study<sup>3</sup>

The purpose of this study was to investigate if variations in response time in rhythm pattern training affect students' singing achievement of rhythm patterns. The problems were to determine if students who echoed rhythm patterns immediately would audiate patterns and perform them better than students who echoed after a two beat pause.

The sample included 73 first-grade students from four classes at an elementary school in a diverse and heterogeneous community in Southern New Jersey. The four intact classes were randomly assigned to two groups. The control group echoed the rhythm patterns immediately and the experimental group echoed after a two beat pause.

All students were administered the rhythm portion of the Primary Measures of Music Aptitude (PMMA) prior to the start of the treatment period. The treatment period began the following week. For six months, students participated in rhythm pattern

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<sup>3</sup> Farrell-McArdle, Colleen. "An Experimental Study of Audiation Time for Rhythm Pattern Instruction on the Rhythm Achievement and Developmental Rhythm Aptitude of First Grade Students." Master Thesis, Rowan University, 2004.

training along with their regular general music activities including tonal pattern training every two weeks. During rhythm pattern training, students were required to echo chant the rhythm patterns as a class and then in solo. The control group echoed the rhythm patterns immediately and the experimental group echoed after a two beat pause. The researcher presented each of the rhythm patterns at the aural/oral level using a neutral syllable. After each student echoed the patterns in solo successfully after weeks of instruction, the researcher presented the performance patterns at the verbal association level using beat function syllables.

At the end of the treatment period, students were tape-recorded individually echoing eight rhythm patterns, four familiar patterns and four unfamiliar patterns, using beat function syllables. Each student echoed the patterns according to the method of their assigned group. The rhythm portion of the PMMA was also re-administered as a posttest to discover any changes in music aptitude. Using a four-point rating scale, two judges evaluated student performances. A Pearson Correlation Coefficient was calculated to determine the reliability for the two judges.

Data for rhythm achievement and music aptitude were organized into two one-dimensional designs for differences. A *t*-test was then calculated for each design to determine the difference between the control and the experimental groups.

The researcher failed to find a statistically significant difference for the rhythm achievement analysis as well as the rhythm aptitude analysis. As a result, it was concluded that variation in response time in rhythm pattern training neither effects students' rhythm audiation or their rhythm achievement.

### Comparison of Related Studies to Present Study

The present study, like the Jarjisian and Feierabend studies, was concerned with the singing achievement of children. However, there were some differences in the design and procedures used by each researcher. The Farrell-McArdle study was most similar in design and in the procedures to the present study, but the purpose of the study was to determine effects on rhythm achievement of children.

One crucial difference between the three studies and the present study was the age of the children participating in the study. All three related studies examined the achievement of first-grade children whereas the present study examined the achievement of fourth and fifth grade students.

Similar to the Farrell-McArdle study, the effectiveness of an audiation pause in tonal pattern treatment was an integral part of present investigation unlike the Jarjisian or Feierabend studies. There was no way of knowing if a pause was used in either of the latter studies.

With regard to tonal pattern instruction, all of the diatonic patterns in the Jarjisian study were taught discretely. More specifically, the diatonic patterns were not chained to produce harmonic implications. It was believed that the students in the diatonic group would have benefited if such chaining occurred. The present study *did include the chaining of tonic and dominant patterns to provide students with a clear sense of a harmonic structure.* In addition, unlike the Jarjisian study, no pentatonic patterns were utilized in the present study.

The length of the experimental period also varied among the three studies. The present study lasted a total of three months. The treatment period in the Feierabend study took place over a seven-week period. Consequently, results of this study indicated that not one of the treatments had a significant effect on singing and/or aural discrimination abilities of first-grade students. However, because of the changes in the mean scores and changes in the correlations between the singing and listening test scores, it was suggested that a longer treatment period might alter the results. The Farrell-McArdle study focused on the rhythm performance achievement of children, however tonal pattern training was included in the instruction due to the students being in developmental stages of music aptitude. Because of this, the treatment period for the study stretched over a six-month period. The present study included older students with stabilized music aptitude therefore instruction focused only on tonal pattern training. The treatment period for the present study lasted for three months.

Another similar procedure among the studies examined was how the patterns were sung/chanted by the students. According to music learning theory, solo singing opportunities as well as group singing opportunities are important for children to learn both tonal and rhythm patterns. Solo singing opportunities were part of the procedures for the present study as well as the Jarjisian study and solo chanting opportunities were given in the Farrell-McArdle study. However, in the Feierabend study, students only sang as a group possibly affecting the results.

Examination of the related studies provided insight for the present researcher and guided the procedures for this investigation. Each study had a positive impact on the

development of this study either through expanding or improving it based on the results and conclusions made by each researcher.

## CHAPTER THREE

### Design and Analysis

#### Sample

The sample for this study consisted of 123 fourth and fifth grade students that were divided into six classes. The elementary school, located in a Southern New Jersey suburban community, is constituted of families that are primarily white and middle to lower class.

#### Procedures

The sample included six intact classes, three fourth-grade classes and three fifth-grade classes. All six classes received music instruction once a week for 40 minutes from the investigator.

Prior to the study, the researcher sent a letter to the principal requesting permission to conduct the study. The letter was sent to the Assistant Superintendent for review and approval. (Appendix A) A letter was also sent to the parents/guardians of all students participating in the study, informing them of the purpose of the study and what was required of their children during the study. (Appendix B)

Upon approval, the researcher outlined a content sequence for tonal pattern instruction. The treatment period lasted for a total of ten weeks beginning on October 18, 2004 and concluding on January 31, 2005. (Appendix C) Because musical aptitude is stabilized by fourth and fifth grade, the researcher only administered tonal pattern instruction during the treatment period without fear of compromising the musical

development of the students participating in the study. The tonal patterns chosen for this study were chosen based on two criteria: 1) their level of aural difficulty from Edwin Gordon's Taxonomy of Tonal Pattern Difficulty Levels; specifically easy and moderate difficulty were used and 2) how easy the patterns are to produce vocally. (Appendix C)

The subjects participated in tonal pattern training during their regularly scheduled music class time. Tonal pattern instruction took place during the first five to ten minutes of each class. The intact classes were randomly assigned to the treatment group and the control group. Two fifth grade classes and one fourth-grade class served as the treatment group and paused before echoing the tonal pattern. One fifth-grade class and two fourth grade classes served as the control group and echoed the tonal patterns immediately.

The Intermediate Measures of Music Audiation (IMMA) was administered during regularly scheduled music classes prior to the beginning of the tonal pattern instruction. (week of 9/27 tonal portion - week of 10/4 rhythm portion) The scores of the IMMA were used to determine each student's level of musical aptitude. Students took both the tonal and rhythm portions of the test, however only the tonal aptitude scores were used in the final analysis. Students that scored at the 50<sup>th</sup> percentile and above were designated to the high aptitude group and students below the 50<sup>th</sup> percentile were designated to the low aptitude group.

Tonal pattern instruction lasted for approximately three and half months beginning the week of October 18<sup>th</sup> and ending the week of January 31<sup>st</sup>. A total of ten weeks of instruction were completed. Five weeks did not include tonal pattern training due to holidays and other conflicts. During the ten weeks that the students had received

the treatment, all students had the opportunity to sing as a group and in solo. At least half of the students each week had the opportunity to sing two patterns designated as test patterns in solo and as a group along with a variety of class patterns. The test patterns included two in major, one tonic and one dominant and two in minor, one tonic and one dominant. Major and minor patterns were sung during alternate weeks. During weeks one and two, major patterns were performed at the aural/oral level using the neutral syllable “bum.” In weeks three and four, minor patterns were performed at the aural/oral level using the neutral syllable “bum.” During weeks five and six, the major patterns from weeks one and two were sung at the verbal association level using solfege syllables. In weeks seven and eight, the minor patterns from weeks three and four were sung at the verbal association level using solfege syllables. Students sang new major patterns in week nine at the aural/oral level and in week ten, students sang new minor patterns at the verbal association level. (Appendix D) Initially, some students were shy to sing in solo, but this lessened as time went on. Those that were shy tended to speak the patterns in echo rather than sing. To accommodate for this, the test patterns were also included as part of the class patterns to ensure that all students were given an opportunity to vocalize the patterns aloud without feeling the embarrassment of singing alone.

At the end of the three and a half months of tonal pattern training, students were tested individually on their singing achievement of tonal patterns. Within two weeks of tonal training (week of 2/14/05), students were tape-recorded singing familiar and unfamiliar tonal patterns on the neutral syllable “bum” in major and minor. (Appendix E) A schedule for taping was issued to all fourth, fifth and special area teachers. (Appendix



F) The investigator recorded the tonal test patterns on a compact disc to use during the testing. The researcher began by introducing the singing task to each of the students utilizing a prepared script. (Appendix G) Then, each student was required to listen to each recorded tonal pattern and to echo sing in his/her best singing voice. During the taping, the researcher noticed that the first five students were having trouble audiating the minor patterns after singing eight major patterns. For the remaining students, the researcher sang a minor triad to the students just before the minor test patterns to help them audiate the tonality. Therefore, those first five students who were tape-recorded were discarded from the data set.

Two judges were trained to evaluate the student performances using a tonal rating scale used by T. Clark Saunders, a professor of music at the Hartt School of Music of the University of Hartford. (Appendix H) During the training session, the judges used several discarded student performances to practice using the rating scale for evaluation. Those students who missed five or more classes during the treatment period were discarded from the data set. Likewise, students that were mainstreamed, those moved to self-contained classes or those students who moved into the district after the treatment period began were also discarded from the data. The judges then used the practice ratings to discuss how each score was decided and to further clarify the meaning of each dimension of the rating scale.

The tonal pattern rating scale is a criterion-referenced rating scale consisting of an ordered sequence of five brief, written descriptions of specific, observable levels of skill achievement. The reliability of the score for the tonal pattern scale was determined when

the two different teachers in Saunders' study awarded ratings to the same students who were tested on the same criteria. An interjudge reliability for the tonal pattern rating scale was found to have a reliability coefficient greater than .77 or approximately 59%, hence the choice for this present study.

After the judges reached sufficient agreement on the practice examples, they proceeded to evaluate the rest of the students' performances. Each recorded performance was evaluated during two sessions. The data were derived by combining the sixteen ratings per student and each of the two judges' scores; therefore, could range between 32 and 160.

#### Analysis

A reliability for the rating scale was calculated, using a Pearson correlation technique. Recorded performances of the 16 patterns from six students, one from each class, served as data. To determine the comparative effects of fourth and fifth grade students who echoed tonal patterns immediately and students who echoed after a pause, and to examine how the variations in response time in tonal pattern training effects the performance of high and low aptitude students, a two-dimensional (2x2) factorial design for differences was used to organize and analyze the data. A two-way analysis of variance (ANOVA) was calculated on the data using the .10 level of significance.

## CHAPTER FOUR

### Results and Interpretations

Inter-judge Reliability. The inter-judge reliability between judges, for the tonal pattern rating scale, was calculated at .915.

Comparative Effects of the Pause Technique. Means and Standard Deviations are presented in Table 1 and the ANOVA Summary Table is presented thereafter in Table 2. The interaction was not found to be statistically significant. Although the observed mean difference shows a strength for the experimental treatment that utilized the pause technique, that mean difference was not statistically significant. There is, however, a main effect for aptitude.

Table 1

Means and Standard Deviations for Treatment and Aptitude

<b>Treatment</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>
Pause	67	119.985	28.74
Non Pause	56	114.732	29.559

<b>Aptitude</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>
Low	80	111.525	29.148
High	43	128.884	25.758

Table 2

ANOVA Summary Table for the Comparative Effects of the Pause Technique

Source	Type III Sum of Squares	df	Mean Square	f
Treatment	650.062	1	650.062	.829 <sup>n.s.</sup>
Aptitude	8926.310	1	8926.310	11.377*
Treatment*Aptitude	496.300	1	496.300	.633 <sup>n.s.</sup>
Error	93364.231	119	784.573	
Total	1804284.000	123		

\*p<.10

Interpretations and Recommendations

As expected, there was a statistically significant mean difference in favor of high tonal aptitude students. That is, students who possess a high tonal aptitude sing better than low tonal aptitude students regardless of treatment. Obviating the possibility of a Type I error.

The main effect for treatment, however, was not found to be statistically significant. The observed mean difference in favor of the pause technique may suggest a Type II error was committed. This may have occurred for several reasons. The treatment period spanned over three and a half months, however, the treatment period actually consisted of only ten weeks of instruction. Unfortunately, the treatment period could not be extended due to restrictions of the master's thesis process. The researcher would recommend a full academic year of instruction to possibly increase the possibility of a statistically significant mean difference between the pause and non-pause techniques.

Another reason for not finding statistically significant differences may have been that both fourth and fifth graders were combined in this study. An adequate number of students were necessary to maintain design integrity and because both groups are stabilized in music aptitude development and are believed to be equal in singing development, a combination of fourth and fifth graders were utilized in this study.<sup>1</sup> Hence, the researcher would recommend increasing the sample size and using discrete grade levels rather than combined ones.

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<sup>1</sup> Phillips, Ken. Teaching Kids to Sing. New York, New York: Schirmer Books, (1992).

## CHAPTER FIVE

### Summary and Conclusions

#### Purpose and Problem

The purpose of this study is to examine variations of response time in tonal pattern training. The problem of the study is twofold. 1) To determine the comparative effect of fourth and fifth grade students who echoed tonal patterns immediately and students who echoed after a pause, and 2) to examine how the variations in response time in tonal pattern training effects the performance of high and low aptitude students.

#### Procedures

The sample for this study consisted of approximately 140 fourth and fifth grade students who attended an elementary school located in a Southern New Jersey suburban community. The sample included six intact classes, each class randomly assigned to the treatment group and the control group. Two fifth grade classes and one fourth-grade class served as the treatment group and one fifth-grade class and two fourth grade classes served as the control group. All six classes received music instruction once a week for 40 minutes from the investigator.

The Intermediate Measures of Music Audiation (IMMA) was administered to the students during regularly scheduled music classes prior to the beginning of the tonal pattern instruction to determine each student's level of musical aptitude. The subjects

participated in tonal pattern training during their regularly scheduled music class time during the first five to ten minutes of each class.

Tonal pattern instruction lasted for approximately three and half months resulting in a total of ten weeks of instruction. During the treatment period, students sang tonic and dominant tonal patterns in major and minor, first at the aural/oral level and then at the verbal association level. The control group echoed the patterns immediately and the treatment group echoed after a short pause. Students in both groups had the opportunity to sing as a group and in solo.

At the end of the three and a half months of tonal pattern training, students were tested individually on their singing achievement of tonal patterns. Within two weeks of the completion of the tonal training, students were tape-recorded singing familiar and unfamiliar tonal patterns on the neutral syllable “bum” in major and minor. Two judges were trained to evaluate the student performances using a criterion-referenced tonal rating scale.

## Results

The interjudge reliability between judges was calculated at .915. No statistically significant differences were found for either the interaction or main effect for the treatment. As expected, however, a main effect for aptitude was confirmed through statistical analysis.

## Conclusions and Recommendations

Based on the evidence acquired from this study, it cannot be concluded that variations of response time in tonal pattern training is a necessary component for learning theory pedagogy. The researcher would recommend a full academic year of instruction to possibly increase the possibility of a mean difference between the pause and non-pause techniques. Furthermore, the researcher would recommend an increase in sample size and the use of discrete grade levels rather than combining two grade levels. Finally, it would also be interesting to determine how a variation in response time in tonal pattern training would affect younger students still in music aptitude development.



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**APPENDIX A**

**Letter of Intent**

Melodey Kleva-Forchic  
Music Teacher  
Whitehall Elementary School  
Whitehall Road  
Williamstown, NJ 08094

Mr. John Muller  
Principal  
Whitehall Elementary School

September 19, 2004

Dear Mr. Muller,

In partial fulfillment of my Master's in Music Education program at Rowan University, I am required to complete a master's thesis involving a research project. I would like your permission to utilize the fourth and fifth grade students at Whitehall School this school year in my quantitative study.

The purpose of the study is to examine how a variation in response time in tonal pattern training effects student achievement and specifically how the variation in response time effects the performance of students with high and low musical aptitude. All procedures would be completed during their weekly music class including administering the Intermediate Measures of Music Audiation test and tonal pattern training. All student's names and scores will be kept confidential.

According to Music Learning Theory, children learn music much in the way they learn language, sound before sight. Tonal and rhythm pattern training are like building a musical vocabulary which enables students to better understand the music they hear. I am particularly interested in the teaching techniques that are used when presenting tonal and rhythm patterns. Rhythm patterns are to be repeated immediately after hearing whereas tonal patterns require a slight pause before response. The pause is intended to allow for audiation of the pattern before responding, but why isn't the pause necessary in the rhythm patterns? The research project I'd like to conduct this year will hopefully provide some insight as to whether or not the pause improves student achievement of tonal patterns.

Please contact me if you have any further questions or concerns. I look forward to involving the students of Whitehall School in this valuable educational research. Thank you for your consideration.

Sincerely,

Melodey Kleva-Forchic

**APPENDIX B**

**Parent Letter**

# From the Music Department

October 4, 2004

Dear Parents/Guardians, Teachers and Students,

Greetings! Currently I am enrolled in the Master's in Music Education program at Rowan University. As part of my program requirements I will be conducting an educational research project with the fourth and fifth grades students at Whitehall School this year.

According to Music Learning Theory, children learn music much in the way they learn language, sound before sight. Tonal and rhythm pattern training are like building a musical vocabulary which enables students to better understand the music they hear. I am particularly interested in the teaching techniques that are used when presenting tonal patterns. Therefore my research project is designed to gain insight into how a variation in response time affects students' success in performing tonal patterns.

All procedures will be conducted during the students' weekly music class. No additional time commitment will be required from the students. Please be assured that all students' names will be kept confidential.

If you have any further questions, please feel free to contact me at school at extension 7109. I look forward to involving the students of Whitehall School in this valuable educational research.

Yours truly,

Mrs. Melodey Kleva-Forchic

## APPENDIX C

### Sequence/Schedule of Patterns

## Sequence/Schedule of Patterns

<b>D Major Tonic</b>	<b>D Major Dominant</b>		<b>d minor tonic</b>	<b>d minor dominant</b>	
Do mi do (e)	Re ti re (e)	Week 1 A/O	La do la (m)	Ti si ti (e)	Week 3 A/O
So mi do (m)	Re so re (m)	Week 2 A/O	Mi do la (m)	Mi ti si (m)	Week 4 A/O
Do mi do (e)	Re ti re (e)	Week 5 VA	La do la (m)	Ti si ti (e)	Week 7 VA
So mi do (m)	Re so re (m)	Week 6 VA	Mi do la (m)	Mi ti si (m)	Week 8 VA
Mi do so (d)	Ti re so (m)	Week 9 A/O	La do mi (m)	Si mi (m)	Week 10 A/O



**APPENDIX D**

**Schedule for Tonal Pattern Instruction**

## Schedule for Tonal Pattern Instruction

Date	Notes/Comments	Patterns for Instruction	Objective
10/18	Some students shy to sing About 1/4 of class w/pause sang in solo & 1/2 of class w/o pause	Week 1	Major patterns A/O
10/25	Students still a bit shy about singing; explained to them that they need to practice now because at the end I will be recording them individually All students sang between last week and this week (made up for the 1/4 classes) Sometimes the pause students sing immediately; reminding them to wait for my cue.	Week 2	Major patterns A/O
11/1			No School
11/8	Half of the students sang test patterns individually; all sang as group Some individuals are not trying to sing; they speak patterns as echo	Week 3	Minor patterns
11/15	Some students still shy to sing out; I am including the test patterns in the class patterns so that all students have an opportunity to vocalize the patterns	Week 4	Minor Patterns
11/22		Short week	No pattern training
11/29	Students are improving on following cues for echoes	Week 5	Major patterns VA
12/6	Training went well for all students	Week 6	Major patterns VA
12/13			Make-up week
12/20		Concert week	No training
1/3	Students have had 3 weeks w/o tonal training. However, they picked up again very easily. No major problems or mis haps.	Week 7	Minor patterns VA
1/10	Continued training, went well.	Week 8	Minor patterns VA
1/17	No tonal pattern training.	Short week	Rhythm training
1/24	A lot of absences this week in fifth grade & Monday "pause" class had training on Thursday because of a snow day.	Week 9	Major patterns A/O
1/31	Completed training, went well	Week 10	Minor patterns A/O

## APPENDIX E

### Test Patterns

## Test Patterns

Familiar

Unfamiliar

<b>D Major Tonic</b>	<b>D Major Dominant</b>	<b>D Major Tonic</b>	<b>D Major Dominant</b>
Sol mi do	Re ti re	Mi so mi	Re ti so
Do mi do	Ti re so	So do so	So fa ti
<b>d minor tonic</b>	<b>d minor Dominant</b>	<b>d minor tonic</b>	<b>d minor dominant</b>
La do la	Mi ti si	Do mi la	Si ti mi
Mi do la	Ti si ti	La mi la	Mi re ti

**APPENDIX F**  
**Recording Schedule**

February 9, 2005

Dear 4<sup>th</sup> and 5<sup>th</sup> Grade Teachers,

As a reminder, I have been working on my master's thesis in music education. I have been echo singing with the 4<sup>th</sup> and 5<sup>th</sup> grade classes in hopes of determining which of two teaching techniques is more effective. The students have been responding very well over the past few months and we have just finished our final week of pattern training for the project. The next step in the process will be to tape-record each student singing individually. For me to accomplish this step, I will need your help and cooperation.

On Wednesday, February 16<sup>th</sup> and Thursday, February 17<sup>th</sup> I have made arrangements to use the TAG room for recording the students' singing. This way I am close to the 4<sup>th</sup> and 5<sup>th</sup> grade classrooms and there won't be much time wasted walking back and forth. I am requesting that during the time allotted for your class (listed below) your students to be allowed to come to the TAG room one at a time for recording. Each student should only be gone from the room between 3 to 5 minutes. To keep a steady stream of students, once a student returns, a new student should be sent to me. There are approximately 165 students to record over the two-day period so it would be important to keep them coming as the other students return to your room.

Below is a schedule to guide us through the recording process. The teachers with an \* by their name please send 2 students to me to start, afterwards, one at a time. If the class prior to yours finishes sooner, a student or I will come by to start the next class.

**Wednesday, February 16<sup>th</sup>**

**9:05 Hansbury\***

**11:00 Goodman**

**1:00 Klein\***

**2:30 Bettencourt**

**Thursday, February 17<sup>th</sup>**

**9:05 Marchesani\***

**11:00 Goodman**

**1:00 Bettencourt\***

**2:00 D'Angelo**

I can't tell you how much I appreciate your assistance. Once I accumulate all of this data, the fun part begins....writing the paper!!

Thanks again to everyone involved.

Sincerely,

## APPENDIX G

### Test Script

Hi \_\_\_\_\_,

Today we are going to play our singing game and record your singing. You will hear tonal patterns using “bum”. After you hear the pattern, echo the pattern using your best singing voice. Remember, there are no wrong responses so please stay relaxed and try your best.

Let’s get started.

(Start recorded examples, pause between each pattern to allow students time to respond.)



**APPENDIX H**  
**Tonal Pattern Rating Scale**

## Tonal Pattern Rating Scale

The Student's performance of the tonal pattern:

- 5) Was accurate and included precise pitch.
- 4) Was nearly accurate but lacked precise intonation.
- 3) Contained appropriate melodic direction and included some (at least one) accurate pitches.
- 2) Contained melodic direction but excluded any accurate pitches.
- 1) Was not recognizable.

