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AN EXPERIMENTAL STUDY OF TONAL PATTERN TRAINING AND
LEARNING MODALITIES ON THE PITCH ACCURACY
OF FIRST GRADE STUDENTS

By
Melissa C. Strong

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts in Music Education
Of
The Graduate School
At
Rowan University
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Approved by

Professor

Date Approved

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ABSTRACT

Melissa C. Strong

An Experimental Study of Tonal Pattern Training and Learning Modalities on the Pitch

Accuracy of First Grade Students

2003

Thesis Advisor: Dr. Lili Levinowitz

Master of Arts in Music Education

Graduate Division of Rowan University

The purpose of this study was to investigate the use of the body scale in the tonal pattern training of first-grade students. The problem of this study was to determine the comparative effects of tonal pattern instruction with and without the use of the body scale on the singing accuracy of first-grade students among auditory, visual, and kinesthetic learners.

Sixty-seven first grade students in four intact classes were used as the sample in this study. Two of the classes were randomly assigned to serve as the control group and

two classes were assigned to serve as the experimental group. All subjects were pretested for pitch accuracy and learning modality preference.

During the 12 weeks of treatment, students in both the control and experimental groups received similar tonal pattern instruction. The main difference existed in that the control group received tonal pattern training without a body scale while the experimental group received tonal pattern training that included a body scale.

At the conclusion of the 12 weeks of treatment, students were individually tape-recorded singing a rote song and their performances were judged by two independent music teachers. Interjudge reliabilities for the pretest and posttest were .67 and .70, respectively. The researcher failed to find statistically significant differences for the interaction and main effects.

Based on the data acquired from this study, it cannot yet be concluded that the use of a body scale during tonal pattern instruction among students with various learning styles (auditory, visual, kinesthetic) has an effect on the singing accuracy of those young children in first grade.

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CHAPTER ONE

Introduction

It is imperative that music educators maximize allotted general music class time by addressing curriculum to the growing musical development of their young students. This task may be particularly daunting for the elementary music educator, as s/he is working with students during their most formative years of music development and must address both systems that enable music making in the young child-reception and expression.¹

The reception system for understanding and thinking about music is closely aligned with audiation.² Audiation is defined by Edwin Gordon as the process that “takes place when we hear and comprehend music for which the sound is no longer present.”³ This intellectual process for thinking intelligently about music is also the construct upon which music aptitude is based.⁴

¹ Lili M. Levinowitz , “A Golden Age for Early Childhood Music Education,” Teaching Music, 9 (2001), p. 3.

² Lili M. Levinowitz, “ The Importance of Music in Early Childhood,” General Music Today,” 12 (1998), p. 1.

³ Edwin E.Gordon, Learning Sequences in Music: Skills, Content and Patterns (Chicago, Illinois: G.I.A. Publications, Inc., 1993), p. 13.

⁴ Darrell L. Walters and Cynthia Crump Taggart, eds., Readings in Music Learning Theory (Chicago, Illinois: G.I.A. Publications, Inc., 1989), pp. 7-8.

The elementary music teacher is responsible for the development of audiation and music aptitude during a particularly vulnerable period in a child's life. That is, during the years of birth through age nine, a child's music aptitude is volatile and is susceptible to outside environmental factors such as the quality of instruction.⁵ In recent years, inquiry into the effectiveness of specific curricular strategies has revealed that pattern instruction has a positive influence on the audiation ability of elementary children and should be included in elementary music instruction.^{6 7 8 9 10 11}

⁵ Walters and Taggart, eds., p. 46.

⁶ Daniel J. Belmondo, "A Study of the Effectiveness of Partial Synthesis as a Readiness for Tonal Music Reading," Diss. Temple University, 1986.

⁷ Elspeth A Foley, "Effects of Training in Conservation of Tonal and Rhythmic Patterns on Second-Grade Children," Journal of Research in Music Education, 21 (1974), p. 247.

⁸ Denise K. Gamble, "A Study of the Effects of Two Types of Tonal Pattern Instruction On the Audiational and Performance Skills of First-Year Clarinet Students," Diss. Temple University, 1989.

⁹ Patricia A. Grutzmacher, "The Effect of Tonal Pattern Training on the Aural Perception, Reading Recognition, and Melodic Sight-Reading Achievement of First-Year Instrumental Music Students," Journal of Research in Music Education, 35 (1987), pp. 177-78

¹⁰ Warren Henry, "The Effects of Pattern Instruction, Repeated Composing Opportunities, and Musical Aptitude on the Compositional Process and Product of Fourth-Grade Students," Contributions to Music Education, 29 (2002),pp. 23-24.

¹¹ Kenneth H. Phillips and Randall E. Aitchison, "The Relationship of Singing Accuracy to Pitch Discrimination and Tonal Aptitude Among Third-Grade Students," Contributions To Music Education, 24 (1997), p. 17.

Specifically in tonal pattern training, the objective is not one of focus on isolated intervals, but on tonal patterns that are constituted of multiple intervals.¹² These patterns connect together to fashion a tonal vocabulary for the student.

An important aspect of a musician's tonal development is the acquisition of a tonal vocabulary, a concept best understood by comparing music acquisition with language acquisition. Whereas words represent vocabulary in language, tonal patterns represent a tonal vocabulary in music. Tonal patterns function within the context of tonality, and each tonal pattern serves a specific function, e.g., tonic, dominant, subdominant, within that tonality.¹³

Tonal pattern training involves a teacher initiating a pattern and students echoing that pattern. Students hear and sing two to four note patterns in a given tonality first using a neutral and eventually proper solfège syllables. They then echo those patterns either in unison as a group or by themselves. The pattern training process can take anywhere from five to ten minutes at the beginning of the music class. The process not only builds a taxonomy of tonal patterns for the student, it enables the teacher to hear and assess the students' tonal progress.

Because this pattern training addresses only auditory strategies for learning, it could be that children who have a preference for learning through visual or kinesthetic modalities may not benefit to the same degree as those auditory learners. A modality, or learning style, is "a biologically and developmentally imposed set of personal characteristics that make the same teaching method effective for some and ineffective for

¹² Eric Bluestine, The Ways Children Learn Music (Chicago, Illinois: G.I.A Publications, 2000), p. 42.

¹³ Walters and Taggart, eds., p. 40.

others.”¹⁴ Since teachers are seeking effective ways to approach instruction that capitalize on the individual strengths of their students, the arena of modalities seems quite relevant to the music teacher’s choice of method.

The three most relevant educational modalities are visual, auditory and kinesthetic. They are described in the following:

Learners who prefer to see or visualize the information are said to have a visual learning preference...Auditory learners, on the other hand, prefer the lecture approach or listening to the stimulus rather than seeing it...If, however, the learners prefer being actively involved by touching the stimulus or responding by moving, they are considered to have a kinesthetic learning preference.¹⁵

In research investigating the effect of instruction using a multi-modal approach to rhythm pattern instruction, Persellin found that “the incorporation of learning modalities into music teaching methods could result in more efficient learning of rhythm patterns.”¹⁶

When music teachers are considering how best to accomplish tonal pattern training, then, these modalities may also need to be addressed.

Presently, some music educators use a combination of scale tones and Curwen hand signs in their tonal pattern training, perhaps in an attempt to address the kinesthetic and visual learners.¹⁷ While the use of hand signs in tonal training has been studied, the

¹⁴ Rita Dunn, Jeffrey S. Beaudry, and Angela Klavas, “Survey of Research on Learning Styles,” Educational Leadership, 50 (1989).

¹⁵ Diane C. Persellin, “Responses to Rhythm Patterns When Presented to Children Through Auditory, Visual and Kinesthetic Modalities,” Journal of Research in Music Education, 40 (1992), p. 307.

¹⁶ Persellin, p. 306.

¹⁷ Beverly A. Martin, “Effects of Hand Signs, Syllables and Letters on First-Graders’ Acquisition of Tonal Skills,” Journal of Research in Music Education, 39 (1991), pp. 161-162.

usefulness of the hand signs has yet to be proven.¹⁸ In particular, for the young child between six and eight years old, one reason why the use of hand signs may not be effective could be linked to the level of motoric development. The Curwen hand signs make use of movement that may be too complex for young children, thus hindering them from fully attending to the singing tasks.

These complexities mainly rest in the fact that the Curwen hand signs call for physical coordination that few early elementary students are able to demonstrate. For instance, the hand signs end away from the body, which may confuse young children who instinctively seek to find the relationship between moving body parts. Also, teachers should wait until after second-grade to introduce movements that use only one specified side of the body, which is required with the Curwen hand signs. These are only two reasons that suggest that Curwen hand signs may not be the most effective method of moving to tonal pattern training for young music students.¹⁹ The following points dealing with effective and purposeful movement for younger children are found in

¹⁸ Mollie R. Autry, "A Study of the Effects of Hand Signs in the Development of Sight Singing Skills," Diss. The University of Texas at Austin, 1975.

¹⁹ Phyllis S. Weikart and Elizabeth B. Carlton, Foundations in Elementary Education: Movement (Michigan: High/Scope Press, 1995), pp. 37-38.

Weikart and Carlton's Guidelines for Simplifying and Judging Difficulty of Movement

Tasks:²⁰

- A) Movements that have endpoints against the body are easier to perceive than movements with endpoints away from the body.
- B) Trunk movement is easier than limb movement, which is easier than finger or toe movement.
- C) Gross-motor movements are easier than fine-motor movements.
- D) Two hands, arms, or legs doing nonlocomotor movements at the same time are easier than one side moving alone.

This knowledge about what early elementary children are motorically capable of seems to imply that the use of Curwen hand signs in conjunction with scale tones in tonal pattern training in the early elementary grades may not be physically appropriate. Some proponents of the Kodaly method have suggested including two-handed, widely spaced sol-mi movement for beginning music students.²¹ However, students in this method only use these movements for those particular scale tones and must eventually re-learn the regular Curwen hand signs as they learn the remaining scale tones in later years, making extra work for both student and teacher in the long run. If a music teacher believes the kinesthetic and visual components in tonal training are necessary, a different way of physically portraying the tones of a scale needs to be investigated. Teachers should seek a way of moving that fits with what is known about the young child's motoric capabilities. Unfortunately, there seem to be few options for the music educator who is

²⁰ Weikart and Carlton, pp. 35-38.

²¹ Lois Choksy, Robert M. Abramson, Avon E. Gillespie, and David Woods, Teaching Music in the Twentieth Century (New Jersey: Prentice-Hall, Inc. 1986), p. 81.

in search of this more physically appropriate representation of the scale to assist in tonal pattern training for younger students.

One promising option may be the body scale developed by Weikart and Carlton, which may be motorically developmentally appropriate for students in the younger grades. The body scale for major tonality is as follows (see Appendix 1 for a pictorial representation of the scale):²²

<u>Solfège</u>	<u>Scale Degree</u>	<u>Body Position (using both hands)</u>
Do	1	knees
Re	2	mid-thigh
Mi	3	waist
Fa	4	chest
So	5	shoulders
La	6	head
Ti	7	slightly above head
Do	8	high above head

Although the appendix shows the tones presented while students are standing, the scale should be adapted so that singers perform the movements of this body scale in either a kneeling or cross-legged sitting manner with their torso in an upright position to ensure proper vocal technique. The way in which young students are made to move using the

²² Phyllis S. Weikart, and Elizabeth B. Carlton, Foundations in Elementary Education: Music (Michigan: High/Scope Press, 1994), p. 35.

scale is appropriate for their level of motor development. The body scale uses both hands simultaneously with end points against the body. Instead of using hand and finger movement that calls on more complex abilities, the body scale uses symmetrical limb movement that is better understood by younger students. When a music educator is seeking a compatible kinesthetic/visual accompaniment to scale tones for tonal pattern training, the Weikart/Carlton scale may be a viable alternative to the Curwen hand signs for young children.

Problem of the Study

Since there is a paucity of research addressing the possible benefit of using a body scale for tonal pattern training, and since a body scale is motorically appropriate for younger students, the current study is designed to investigate the body scale's use in the tonal pattern training of first grade students. The problem of this study is to determine the comparative effects of tonal pattern instruction with and without the use of the body scale on the singing accuracy of first grade students among auditory, visual and kinesthetic learners.

CHAPTER TWO

Related Research

While many studies exist that help the educator understand the effect of tonal pattern training on students' aptitude and achievement, few directly relate to the effects of movement on tonal pattern training. Similarly, studies examining the effects of students' learning modality preference on tonal pattern training are also lacking. The following two studies, therefore, were chosen as the most closely linked to the purpose of the current study, to determine the efficacy of using movement in tonal pattern training.

The Martin Study¹

The purpose of this study was to compare the effects of tonal syllables, hand signs and letter representations of tonal syllables on the verbal and symbolic tonal syllable skill abilities of students in first grade. The study also investigated tonal aptitude and school readiness as they related to these tonal syllable abilities.

The researcher randomly selected 65 first-grade students from one elementary school and assigned each student to one of three groups. All subjects were taught by the researcher and were students at a suburban K-six school in Oklahoma City, Oklahoma. The study was conducted in two parts over a period of 34 weeks during the regular school year. Prior to commencement of the treatment period, students took both the Primary Measures of Music Audiation (PMMA)² and the Metropolitan Readiness Tests (MRT).

¹ Beverly A. Martin, "Effects of Hand Signs, Syllables and Letters on First-Graders' Acquisition of Tonal Skills," Journal of Research in Music Education, 39 (1991), pp. 161-162.

² Edwin E. Gordon, Primary Measures of Music Audiation (Chicago, Illinois: G.I.A. Publications, Inc., 1979).

Three researcher-designed singing tests were used during the study for the purpose of assessing the effectiveness of the three different modes of instruction. In two of the tests, students were asked to echo tonal patterns without visual stimuli; one test required students to sing back patterns that were written on cards.

Each part of the study was broken down into class, training and testing phases. In each session during the entire course of the study, students either echoed or sight-sang tonal patterns chosen from three- or four-note patterns using do, re, mi, sol and la. Group One simply echoed the patterns; Group Two echoed those same patterns while simultaneously using hand signs; Group Three echoed the patterns using hands signs while looking at letter representations of the patterns on cards.

The focus of Part I of the study was on verbal generalization skills, manifested in the students' ability to echo tonal patterns using correct tonal syllables. This portion of the study began with 18 class sessions in which the students echoed the teacher. Following this, there was a three-session training session in which the patterns were presented on the neutral syllable "bum" by the teacher, and the students were asked to sing the pattern back using the appropriate solfege syllables. After one more 18-session class portion and another three-session training portion, the researcher began the testing phase for Part I. Testing was similar to the training sessions, but children were tested individually and recorded singing 20 tests items echoed from a prerecorded tape.

The second part of the investigation concentrated on symbolic association during the class sessions and symbolic generalization in the training and test phases. If a student was able to echo back a pattern using tonal syllables while viewing notation, they were considered to be demonstrating symbolic association. Symbolic generalization occurred

when students were able to sight-sing a pattern from notation. In Part II of the study, a similar sequence of session patterns to that used in Part I was as follows: a) 18 class sessions, b) three training sessions, c) 18 class sessions, d) three training sessions and e) a test session. There was an additional training and testing session, however, at the conclusion of the study.

The main difference in the pattern training of Part II was that all three groups viewed class patterns in note heads on the staff while continuing either echoing alone, echoing with hand signs or echoing with hand signs and cards showing letter representations of the patterns. During the training and testing phases of Part II, students saw the note heads of the sung patterns written on a staff. The researcher then sang the first pitch on “bum” and the students responded with tonal syllables and pitches.

Tapes of each student singing in the testing phase from Parts I and II were then evaluated by three judges on the basis of both tonal syllable and pitch accuracy. Each time a student used a correct tonal syllable, that student received one point. For pitch accuracy, Ms. Martin created a six-point rating scale. Interjudge reliabilities ranged between .9811 and .9945 among all three of the test sessions for this rating scale.

Although the researcher presented no data for school readiness scores, she reports that the variable was dropped because no significant prediction was added for students’ verbal and symbolic syllable skills.

In the study, Ms. Martin found that tonal aptitude was the most powerful predictor of both tonal syllable skills and pitch accuracy for all students. The high-aptitude students made the greatest gains. While the choice of instructional method had a practical effect on student performance, that effect was not statistically significant. That

is, the researcher failed to find statistically significant differences among the students in the echoing alone, echoing with hand signs and echoing with hand signs and letter representation groups.

By the completion of the investigation, Ms. Martin asserted that “at the first-grade level, hand signs, letter representations and note heads may not result in increased pitch or tonal syllable accuracy during tonal pattern singing. Furthermore, if these aids are introduced prematurely, they may cause confusion and impede growth.”

Comparison between the Martin study and the present study

The researcher in the Martin study chose to examine the contribution of three different methods of instruction in tonal pattern training: echoing alone, echoing with hand signs, and echoing with hand signs and letter representations on first-grade students. The researcher of the present study also focused on tonal pattern training and first-grade students, but used only echoing and echoing using a body scale as methods of instruction for tonal pattern training. While pretesting in the Martin study consisted of the PMMA and the MRT to understand music aptitude and school readiness, in the present study the Swassing-Barbe Modality Test and the Rote Song Rating Scale³ were administered to each student prior to the experimental period. These tests were used to assess tonal aptitude, pitch accuracy, and each student’s modality preference, respectively. There was no pretesting in the Martin study to assess each individual’s tonal accuracy as there was in the present study. Furthermore, the experimental period for the present study was shorter than that in the Martin study.

³ T.C. Saunders, “A Supervisor, A Problem, A Solution,” Music Educators Journal, 75 (1989), pp. 48-51.

In the Martin study, Curwen hand signs were chosen by the researcher as the movement to be used in combination with echoing. In the present study, however the researcher in the present study chose a body scale representing tones of the scale to be used with tonal pattern echoing, with the intention that this type of movement was age appropriate.

Patterns chosen for both studies came from the major scale and pattern instruction occurred at the beginning of each class session for a period of less than ten minutes. However, the present study used tonal patterns which added the syllable “ti” to the do, re, mi, fa, sol and la syllables used in the Martin study. While the Martin study began at the verbal association level, using proper syllable names, the present study remained at the aural/oral level of singing, with students echoing patterns on the neutral syllable “bum” during the entire course of the investigation.

In both studies, researchers sought to investigate the impact of different methods of instruction, on tonal pattern training. The major difference exists in the present study’s focus on each student’s learning modality preference. Whereas learning modality preference was not addressed in the Martin study.

The Persellin Study⁴

In the Persellin study, the researcher sought to investigate the impact of three rhythm presentation modalities on the short-term recall of rhythm patterns by students. The author of the study also asked the question if students’ most effective learning modality remained consistent from first through the fifth grades.

⁴ Diane C. Persellin, “Responses to Rhythm Patterns When Presented to Children through Auditory, Visual and Kinesthetic Modalities,” Journal of Research in Music Education, 40 (1992), pp. 306-315.

Prior to the onset of the study, a pilot study was conducted using 55 third-graders serving as subjects. During this preliminary investigation, the researcher found ways to modify the procedures for the main study so that the most appropriate rhythm and tempo choices were made. In the main study, 70 first-graders, 70 third-graders and 70 fifth graders served as subjects. The researcher chose these three grade levels “to permit examination of the effect of maturation on rhythmic recall and to examine whether the effectiveness of presentation modalities changed as children became more skilled at reading.” The students came from two different urban elementary schools. Ms. Persellin chose not to individually test each student in the study to find his or her preferred learning modality. This choice was made by the researcher because she “examined the effects of different teaching presentations at several grade levels as opposed to determining correlations between learning style preferences and short-term rhythmic learning.” (p. 309)

For the purpose of this study, the three most educationally relevant learning modalities were chosen- auditory, visual and kinesthetic. If a student prefers to see information, they are said to be a visual learner. Those who prefer listening to information are said to be auditory learners. Kinesthetic learners are those who enjoy physically interacting with or responding to presented material physically.

Of the 105 students from each school, five were chosen at each grade level to be tested individually in one modality by two investigators. Subjects were randomly selected and sent by their music teachers into a testing room, where they drew a piece of paper indicating one of seven modalities or combinations of modalities. After the investigators spent time establishing rapport and giving brief explanations, testing began.

The subject was then presented with six rhythm test patterns of increasing difficulty. The patterns, which consisted of quarter, eighth and/or half notes, were either one or two measures long, with each measure lasting four beats. The patterns were presented in the same order to each subject.

The following list details the method of presentation for each learning modality:

Visual: The subject views and memorizes an iconic representation from a chart.

Auditory: The subject hears a pattern played on a resonator bell.

Kinesthetic: The subject feels, but does not see, the pattern being patted on their forearm by an investigator.

Visual/Auditory: The subject simultaneously listens to the pattern being played on the resonator bell while looking at the iconic notation.

Visual/Kinesthetic: The subject is patted on the forearm while viewing the pattern.

Auditory/Kinesthetic: The subject listens to the pattern and is patted on the forearm.

Visual/Auditory/Kinesthetic: The subject simultaneously hears and views the pattern while being patted on the forearm.

After the patterns were presented, children were then given the chance to reproduce the pattern by either clapping or patting the desk. Of note was the tendency of the children who received the kinesthetic mode of presentation to pat the desk in contrast with the majority of children who clapped the patterns for the investigators.

For each subject, the investigators tracked the number of trials each subject needed to achieve the correct pattern. If a subject was unable to be accurate after ten trials, the number of trials for subsequent patterns was shortened to five. Points went down for each failed attempt. Subjects received a score of ten if they reproduced the

pattern accurately the first time. A perfect score of 60 was given if a student scored tens on each of the six different test patterns.

Data in the study were labeled as 21 individual cells, each representing one of the modalities or modality combinations for each grade level. Researchers then looked at the mean of each cell to see whether or not any one cell differed significantly from the others. Using a Tukey multiple comparison test, researchers found that the first-grade mean for the visual modality was much lower than the others, and was therefore removed from the analysis.

After further analysis using an incomplete factorial design, it was determined that grade level was significant at the .001 level. Looking at the mean scores for all grades, “the overall cumulative mean scores for all subtests (out of a possible 60 points) progressively increased from 23.0 for the first-graders to 37.9 (third-graders) to 46.8 for the fifth graders.” It was found that as students matured, they performed better on the rhythm patterns.

Ms. Persellin concluded that children did not seem to be confused by multimodal presentations of rhythm patterns. Additionally, the data demonstrated that maturity does have a role in successful rhythm pattern performances from students. Since the first graders did not do well with visual presentations alone, but scored higher when iconic representations of patterns were coupled with other modes of presentation, it was determined that this could be a successful method of teaching first-grader students rhythm patterns. Ms. Persellin also endorsed the use of a variety of teaching methods, including the learning modalities to effectively reach all students.

A comparison of the Persellin study and the present study

In the Persellin study, three different grade levels were used as subjects to investigate the effect of multiple rhythm pattern presentations on the short-term recall of first-, third- and fifth-graders. In the current study the comparative effects of tonal pattern training with and without a body scale on the singing accuracy of first grade students among auditory, visual and kinesthetic learners was studied. The effect of maturation was not of consideration in the current study, as only first-grade students served as subjects. In the Persellin study, rhythm pattern training was the emphasis, whereas tonal pattern training was emphasized in the current study.

Subjects in the Persellin study were tested on their short-term rhythm pattern recall one time only on one testing day. Subjects in the current study participated in a pretest, experimental and posttest period lasting 13 weeks in total. Ms. Persellin executed a pilot study prior to beginning her main study, while the researcher of the current study did not do a pilot study.

In the current study, students were pretested for singing accuracy and learning modality preference on an individual basis. Individual modality preference testing was done in this case in an attempt to see the link between each student's modality preference and their response to certain types of pattern instruction. Ms. Persellin, however, chose not to pretest individual subjects for their modality preference because she was not seeking direct correlations between these preferences and rhythm pattern learning in the individual student. She instead was seeking to find the effects of different teaching strategies to several different grade levels. While both studies attempted to look at the

role of learning modalities and pattern instruction presentation, this emphasis exists as the main difference between the two.

CHAPTER THREE

Design and Analysis

Sample

First-graders (N=67) from Fleetwood Elementary School in Southern New Jersey served as subjects for the study. Thirty-eight male students and twenty-nine female students constituted the sample. Students came from diverse ethnic and socio-economic backgrounds. Four intact classes met with the same instructor twice weekly for 25 minute general music sessions. Ages of the subjects ranged from six to eight years old when the study began.

Procedures

Prior to commencement of the treatment period, permission for the study was sought from the principal of Fleetwood School (See Appendix 2). This approval was given to the researcher, who also served as the music instructor for Fleetwood School. The treatment period began on Friday, January 3, 2003 and was completed on Friday, March 28, 2003. Each group met with the instructor during those 12 weeks twice weekly for a total of 20 general music sessions.

The subjects were audio taped individually singing a rote song, "Jingle Bells," selected by the researcher, during the pretest phase. The Rote Song Rating Scale (RSRS, see Appendix 3) was utilized to measure the pitch-matching accuracy of each student

before the treatment.¹ Two musicians served as judges and independently used the scale to assess the students' pitch accuracy. The combined ratings of the judges were used as data for the pretest.

To establish each student's learning modality preference, the Swassing-Barbe Modality Index (SBMI), see Appendix 4) was given. Its creators describe the test as “a matching-to-sample task... a stimulus item or sample is presented, and the respondent is asked to duplicate the sample.”² Students received the SBMI on an individual basis by the researcher throughout the course of the study. Instruction during the administration of the test was standardized according to the test manual. Results of the test determined each student's preferred learning modality. Students were then separated into three groups based on their preference for learning modality.

Two of the intact first-grade classes were randomly selected to serve as the control group and two classes served as the experimental group. Each group was approximately 34 students in size. The control group (*CI*) received tonal pattern instruction consisting of scale tones on a neutral syllable alone, while the experimental group (*EI*) received tonal pattern instruction using scale tones on a neutral syllable and a body scale. Prior to the beginning of treatment, *EI* learned and practiced body scale patterns without singing during the first five minutes of two general music class sessions.

In each general music class session for the duration of the experimental period students took part in tonal pattern instruction during the first five to seven minutes of

¹ T.C. Saunders, “A Supervisor, A Problem, A Solution,” Music Educators Journal, 75 (1989), pp. 48-51.

² Walter B. Barbe, and Raymond H. Swassing, Teaching Through Modality Strengths: Concepts and Practices (Columbus, Ohio: Zaner-Bloser Inc., 1979), p. 35.

each session. Each time the pattern instruction was given, the instructor used no more than four different tonal patterns. The patterns were constituted from both the major tonic and dominant chords. No pattern was less than two or more than four notes each. Patterns used in the study and the chronology of their introduction can be found in Appendix 5. The instructor sang a nine-note pattern in the neutral syllable “bum,” sol-la-sol-fa-mi-re-ti-do, to signal the start of the pattern training and prepare the students aurally for major tonality. The students had the opportunity to sing in unison with other students and as soloists as they echoed the instructor. It is important to note that the *EI* group received a one-minute silent movement practice to ensure consistent movement for the body scale patterns.

The treatment was divided into three segments, each approximately three weeks in length. In each segment, students learned and then were tested on one major tonic and one major dominant tonal pattern. During the first class session of each segment, both groups learned and echoed the same tonal patterns on the neutral syllable “bum.” The *EI* group simultaneously saw the body scale counterpart that corresponded to the solfege syllables at the same time the teacher sang the tonal pattern on a neutral syllable. The students in that group then echoed both the pattern using “bum” and the corresponding body scale movement. For the remaining classes of each three-week segment, students had at least four chances to sing the two tonal test patterns in solo.

The remaining segments of the experimental phase followed a similar pattern with new tonal patterns being introduced on the neutral syllable “bum” during one week and the same patterns being practiced and sung during the next two weeks. When the instructor presented the patterns, Group *C1* always echoed back on those scale tones

alone, while Group *EI* always echoed back with the tones and the corresponding body scale movement.

At the conclusion of the experimental phase, the students in both groups were posttested singing Jingle Bells using the RSRS, utilizing the same methods as in the pretest phase.

Analysis

Interjudge reliabilities were calculated on both the pretest and posttest performances of the criterion song using a Pearson Product-Moment correlation. To determine if there were statistically significant mean differences at the onset of the experiment on the rote singing data between the two groups, an independent mean *t*-test was calculated.

To understand the differences that arise after the treatment period, a two-way analysis of variance (treatment x modality) was calculated to determine group differences among modality preferences.

CHAPTER FOUR

Results and Interpretation

Interjudge Reliabilities. The pretest interjudge reliability for the Rote Song Rating Scale was .67. Furthermore, the researcher failed to find statistically significant mean differences ($t_{(65)} = -1.474$) between the experimental and control groups. The posttest interjudge reliability for the Rote Song Rating Scale was .70.

The Comparative Effects of Tonal Pattern Instruction. Means and standard deviations for the rote song among the treatment groups and modalities are presented in Table 1. As can be seen in Table 1, the means ranged between 6.33 and 7.8.

Table 1
Means and Standard Deviations for the Tonal Pattern Instruction Condition

Modality	Treatment	Mean	SD	N
Visual	Control	7.00	1.97	18
	Experimental	6.62	2.14	13
	Total	6.84	2.02	31
Auditory	Control	7.80	1.69	10
	Experimental	7.60	1.78	10
	Total	7.70	1.69	20
Kinesthetic	Control	6.33	1.97	6
	Experimental	6.90	1.73	10
	Total	6.69	1.78	16
Total	Control	7.12	1.90	34
	Experimental	7.00	1.90	33
	Total	7.07	1.89	67

The ANOVA summary information for the Tonal Pattern Instruction Condition is presented in Table 2. The researcher failed to find statistically significant interaction and main effects for all conditions.

Table 2
The ANOVA Summary Table for the Tonal Pattern Instruction Condition

Source	SS	df	MS	F
Modality	13.03	2	6.52	1.80 ^{n.s.}
Treatment	5.38	1	5.38	.00 ^{n.s.}
M X T	2.33	2	1.16	.32 ^{n.s.}
Error	221.31	61	3.63	
Total	3575.00	67		

Interpretations

For both instances of judging, there was significant agreement that affirms the reliability and usefulness of the Rote Song Rating Scale.

For the treatment condition, the researcher failed to find statistically significant mean differences. This may have occurred for several reasons. First, it is possible that a Type II error was committed; that is, because of the sample size and duration of the experimental period, it is possible that a difference exists that could not be detected through this research study.

It could be, however, that there is little pedagogical benefit for learning tonal patterns with a body scale at the aural/oral level of learning. According to Edwin E. Gordon, the continuous learning loop, which involves moving from aural to oral, back

and forth, is the way students develop audiation skill.¹ Perhaps, the visual component draws attention away from that audiation process.

It is a surprise, however, that the researcher failed to find statistically significant mean differences among the modalities of the students. One would expect an interaction effect. That is, an auditory learner would benefit from the control condition of instruction whereas the visual and kinesthetic learners would benefit from the experimental condition. Therefore, it is reasonable to suggest that, again, a Type II error was committed because of the low number of students participating in the study.

¹ Edwin E. Gordon, Learning Sequences in Music: Skill, Content and Patterns, A Music Learning Theory (Chicago, Illinois: G.I.A. Publications, 1997), p. 90.

CHAPTER FIVE

Summary and Conclusions

Purpose and Problem

The purpose of this study was to investigate the use of the body scale in the tonal pattern training of first-grade students. The problem of this study was to determine the comparative effects of tonal pattern instruction with and without the use of the body scale on the singing accuracy of first-grade students among auditory, visual and kinesthetic learners.

Design

Sixty-seven first grade students served as the sample for the study. The students came from four intact first grade classes. Two of the classes were randomly selected by the researcher to serve as the control group (*CI*) and two of the classes were randomly selected to serve as the experimental group (*EI*). Both groups received general music instruction twice weekly during the study for 25 minutes. The researcher of this study also served as the music teacher.

Before the treatment began, subjects in the study were audio taped singing “Jingle Bells” during the pretest phase. Two independent judges used the Rote Song Rating Scale (RSRS) to measure the pitch-matching accuracy of each student. Reliability for the two judges was calculated using a Pearson test. In the scores for the RSRS, no statistically significant mean differences existed between the control and experimental groups.

Throughout the treatment period, the Swassing-Barbe Modality Index (SBMI) was used to establish each student's learning modality preference.

During the 12 weeks of treatment, students in both the control and experimental groups received similar tonal pattern instruction. The main difference was that the control group received tonal pattern training without a body scale while the experimental group received tonal pattern training that included a body scale.

Pattern training lasted five to seven minutes at the beginning of each class session. The patterns chosen were taken from tonic and dominant chords and were in major tonality. Students had the opportunity to sing in unison with other students and as soloists as they echoed the instructor. In the *CI* group students echoed on the neutral syllable "bum" only, while students in the *EI* groups sang and performed the body scale movement. The *EI* group had a one- to two-minute silent movement practice each class session to ensure consistent movements for the body scale patterns.

At the conclusion of the treatment period, the students in both groups were posttested singing "Jingle Bells" using the RSRS. The same methods used in the pretest period were used.

Results

The pretest and posttest interjudge reliabilities for the RSRS were .67 and .70, respectively.

For both treatment and learning style conditions, the researcher failed to find statistically significant differences for the interaction and main effects.

Conclusions

Based on the data acquired from this study, it cannot yet be concluded that the use of a body scale during tonal pattern instruction among students with various learning styles (auditory, visual, kinesthetic) has an effect on the singing accuracy of those young children in first grade.

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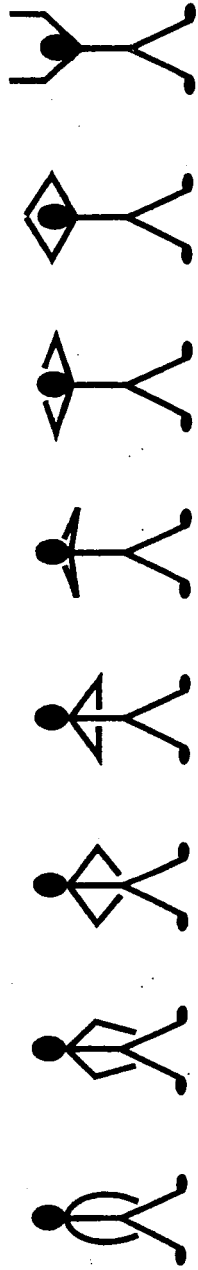
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APPENDIX ONE

The Body Scale



Scale degrees:	1	2	3	4	5	6	7	8
Tones (C-major):	C	D	E	F	G	A	B	C
Solfège:	do	re	mi	fa	so	la	ti	do
Body position:	(knees)	(mid-thigh)	(waist)	(chest)	(shoulders)	(head)	(slightly above head)	(high above head)

APPENDIX TWO

December 20, 2002

Linda Dickerson
Principal
Fleetwood School
Mt. Laurel Township, NJ

Dear Mrs. Dickerson,

I am writing this letter to request permission to conduct a study for my Master's Thesis at Rowan University. I would specifically like to work with the First grade classes that are in my current schedule. The study period will take place over 12 weeks, beginning January 3, 2003 and ending April 4, 2003. The treatment will include the use of tonal pattern training using a body movement scale and training with tonal patterns alone. All instruction will be based on the board- approved curriculum and will be the same for both control and experimental groups, with the exception of the addition of the body scale for the experimental group. Prior to treatment, all students will take a music aptitude, singing accuracy and learning modality test. At the conclusion of the treatment period, students will receive only the singing accuracy test.

Please feel free to contact me with any questions, concerns or further explanation. I thank you in advance for your consideration of my request.

Sincerely,

Melissa Strong
Music Specialist
Fleetwood School

APPENDIX THREE

ROTE SONG RATING SCALE

The student's performance of the song:

1. Did not include the use of the singing voice.
2. Included the use of the singing voice and a general sense of melodic direction.
3. Included the maintenance of a pitch center and general sense of melodic direction.
4. Was nearly accurate but included a minimum of imprecise pitches.
5. Was accurately sung with precise pitch.

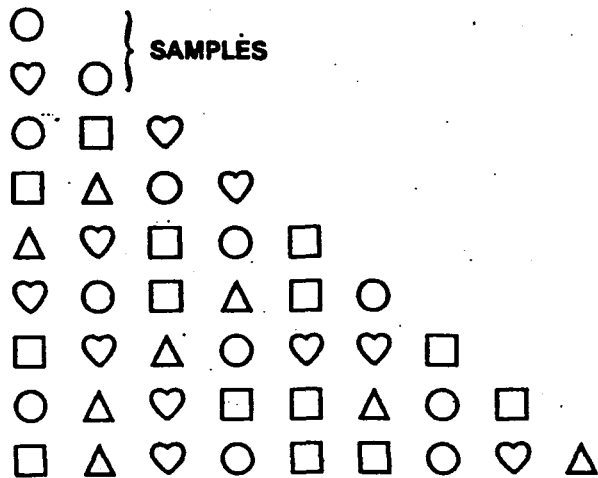
APPENDIX FOUR

RECORD SHEET

_____ Date: _____

Name: _____ Examiner: _____

Birthdate: _____ Sex: F _____ M _____ Grade: _____ Dominant Hand: L _____ R _____



VISUAL TEST:

Show set of shapes; follow timing guidelines as outlined in directions. Remove card at end of time limit or when child indicates she/he is finished if before allotted time. Child assembles sequence just seen. Mark answer sheet. Stop test when child has made errors on two consecutive sets.

TOTAL VISUAL CORRECT: _____

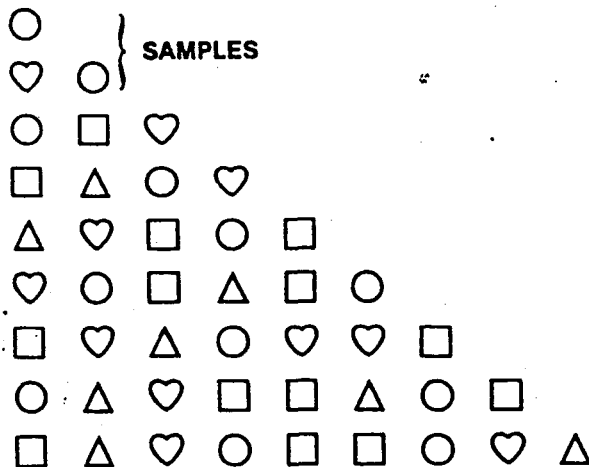
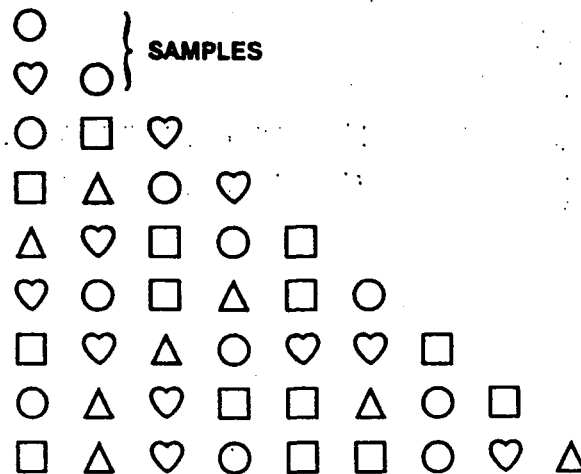
Before proceeding, ask child how she/he arrived at answer _____

AUDITORY TEST:

Read aloud the names of shapes in sequence at rate of one per second. Child assembles sequence of shapes just heard. Mark answer sheet. Stop test when child has made errors on two consecutive sets.

TOTAL AUDITORY CORRECT: _____

Before proceeding, ask child how she/he arrived at answer _____



KINESTHETIC TEST:

Holding shield so child cannot see shapes, put set in front of child; place child's dominant hand on first shape on left; child may use both hands. Do not speak during test. If child accidentally skips a shape, place her/his hand on missed shape. Follow timing guidelines as outlined in directions; remove set and shield. Child assembles sequence. Mark answer sheet. Stop when child has made errors on two consecutive sets.

TOTAL KINESTHETIC CORRECT: _____

Ask child how she/he arrived at answer _____

VISUAL CORRECT: _____

AUDITORY CORRECT: _____

KINESTHETIC CORRECT: _____

TOTAL CORRECT: _____

PERCENTAGE VISUAL: _____%

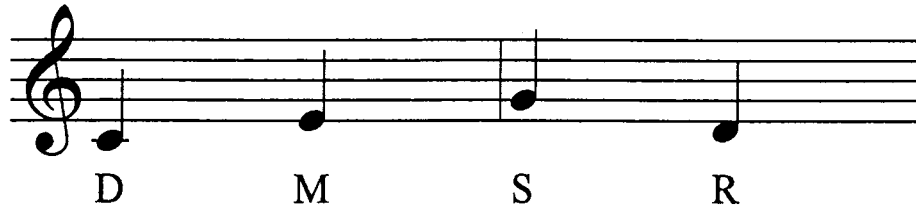
PERCENTAGE AUDITORY: _____%

PERCENTAGE KINESTHETIC: _____%

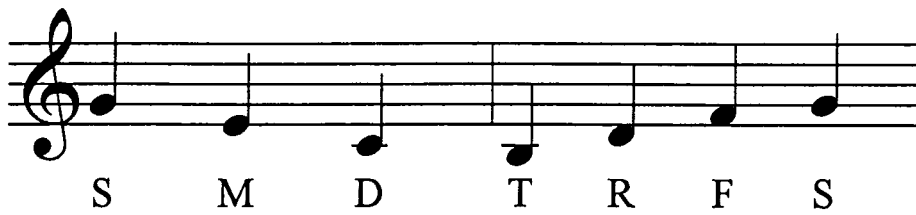
APPENDIX FIVE

Chronology of Pattern Introduction

Weeks 1-3
Starting 1/7/03



Weeks 4-6
Starting 1/28/03



Weeks 7-9
Starting 2/21/03



Weeks 10-12
Starting 3/11/03

