THE APPLICATION OF COGNITIVE LOAD THEORY TO

TEACHING MUSIC READING

by

SYLVIA TODD PRICE

(Under the Direction of Mary Leglar)

ABSTRACT

This research investigated the application of Cognitive Load Theory (CLT) to the teaching of music reading. CLT allows the instructor to construct lessons with selected information presented until students have sufficient knowledge to know and use the whole concept. Elementary music students were taught music notation during recorder instruction. Only pertinent, initially modified, musical symbols were utilized, such as a two-line staff. As student knowledge and understanding grew, lines and spaces were added to the staff, as well as clefs, meter signatures, and other musical symbols normally found in written music. The traditional method presents the complete five-line staff at the first use of written music. A CLT-modified teaching approach was compared to the traditional method of teaching music reading.

INDEX WORDS: Music reading, Music notation, Cognitive Load Theory, Elementary music.

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CHAPTER I

INTRODUCTION

Music educators constantly seek new and better strategies to apply in teaching students to read music. Not only must the method used be pedagogically solid, it must be efficient as well. Providing sufficient instructional time for teaching the arts in the context of public education has always been a challenge, especially when state or national legislation places high stakes on subjects other than the arts. Currently, the "No Child Left Behind" legislation is, in many cases, reducing the time made available for arts education. In this climate, there has been renewed interest among music teachers about how to teach the skill of music reading effectively, given reduced classroom time.

Teaching elementary students to read music notation is related to teaching language literacy. Whether students are learning to read written language or music notation, they must decode symbols; build vocabulary; develop listening and rhythm skills; memorize knowledge and symbols; acquire or improve small- and large-motor skills; and extend thinking, creative, and communication skills (McIntire, 2007, p. 44). The application of Cognitive Load Theory (CLT) to the complicated process of teaching music reading is one that may help students learn to read music notation more quickly and easily than traditional methods.

Simply stated, Cognitive Load Theory recognizes the possibility of early over-saturation in the learning process and suggests teaching strategies/procedures to avoid or

diminish it. In summary, the theory is as follows: there are three memory stores that information passes through in the learning process—1) sensory memory (the five senses through which data is received); 2) working memory (the phase that processes information collected by the sensory memory); and 3) long-term memory (the phase in which processed information is stored for later use). Cognitive overload occurs when the working memory can no longer process information in the quantities or at the speed with which it is being presented. Overload can readily occur if teachers fail to realize that the working memory can store only about seven "chunks" of data, and that the stored data can be retained only about 12 seconds without elaborate rehearsal. If information is not moved from the working memory to the long-term memory quickly enough, it accumulates and creates overload.

The application of CLT principles allows the instructional designer, the teacher, to manage the educational environment better and control the amount of material presented to pupils. Because learning to read music involves a number of different elements, e.g., pitch, rhythm, and dynamics, students are often overwhelmed by all the details. Which note is the line note? Which is the space note? Is the note in question a quarter or half? Should this one be played *forte* or *piano*? Does it make a difference whether the stem goes up or down? Why is that dot beside the quarter note? What do the clef, meter signature, and key signature have to do with notes and durations? As mentioned above, reading music requires decoding its many symbols much the same way as reading written language.

Thus, it is possible to hypothesize that reading music notation can be made simpler, more accessible, for elementary students with the application of CLT. Further,

the process of teaching students to read music may be better served by employing a tightly organized sequential process, rather than a holistic approach.

Need for the Study

The current constraints on time spent on the arts in the elementary classroom places renewed emphasis on the methodology used to teach the skill of reading music. While the principles of CLT have been found to facilitate the learning process in other subjects, the effect of a conscious use of the approach remains undocumented in the field of music.

Purpose of the Study

The purpose of the study was to apply the principles of Cognitive Load Theory to teaching students how to read music within the process of learning to play the recorder. It was hypothesized that the use of CLT principles would improve accuracy and rate of learning. To facilitate the analyses of the data and the drawing of conclusions, the following null hypothesis was formulated:

Null Hypothesis: There will be no difference in the accuracy or rate of learning in students who are instructed using CLT principles and those instructed using the traditional holistic approach.

Specifically, the following questions were posed:

- Will learners accomplish reading tasks more accurately with the application of CLT in the learning process?

- Will learners accomplish reading tasks more quickly with the application of CLT in the learning process?

Limitations

Subjects were limited to four intact fourth-grade classes in a public school. The experiemental periods were limited to regularly scheduled classes and were subject to changes in time/day required by the general school schedule. The conclusions drawn from the study are limited to those generalizations allowed by the experimental design, procedures, and criterion measures employed.

Definition of Terms

Within the document, the following terms are employed.

Chêvé Rhythm Syllables: A system, attributed to Emile Joseph Chêvé (1804-1864) for reading rhythm through assigning specific syllables to note values. The system was adopted by Zoltan Kodàly and is currently used in Kodàly methodology.

Cognitive Load Theory: A theory purporting that there are three memory stores through which information passes in the learning process—1) sensory memory (the five senses through which data is received); 2) working memory (the phase that processes information collected by the sensory memory); and 3) long-term memory (the phase in which processed information is stored for later use). Cognitive overload occurs when the working memory can no longer process information in the quantities or at the speed with which it is being presented.

Curwen/Glover Hand Signs: A method giving physical placement for the solfege syllables (do re mi, etc.). In the 18th century, John Spencer Curwen drew upon an earlier music teaching system known as Norwich Sol-fa, which had been devised by Sarah Glover, and developed hand signs to go with the solfege syllables. Kodàly integrated these hand signs into his teaching methods.

Solfege: A pedagogical technique used for the teaching of sightsinging in which each note of the score is sung to a special syllable, called a solfege syllable (or "sol-fa syllable"). The seven syllables commonly used for this practice in English-speaking countries are: do, re, mi, fa, sol, la, and ti.

Recorder: An instrument of the whistle flute class, made of plastic rather than wood, that allows elementary students to play with ease of air-flow. The instrument has seven finger holes and a thumb hole.

Summary of Procedures

The study compared the final performance of two experimental groups learning to read music notation. Subjects (N=85) were fourth-grade students attending public school in a metropolitan area in the Southeast.

Four intact fourth-grade classes were randomly assigned to one of two groups, control or experimental. The control group was instructed using traditional methods—students were initially introduced to the standard five-line staff displaying the treble clef, meter signature, key signature, and standard pitch/duration notation. The experimental group was instructed using CLT principles—symbols extraneous to the specific learning task were not presented until readiness levels were reached. The experiment consisted of

fifteen lessons for each group. Lesson plans were guided by the same conceptual and behavioral objectives, with differences occurring only in the amount of material displayed on the staff.

The design of the study was a modified pre-test/post-test. Progress was ascertained at the midpoint of the experiment. Data collected from the two groups was compared and reported via descriptive graphs. An ANOVA was used to determine effect of group*gender (interaction between group and gender).

Organization of the Study

The document contains five chapters with appendices and bibliography. Chapter I provides: (1) rationale and need for the study; (2) statement of purpose; (3) hypotheses; (4) limitations; (5) definition of terms; (6) summary of procedures; (7) organizational outline of the written document. Chapter II contains a critical review of literature related to the general and specific purposes of the study and to methodologies appropriate to the study. Chapter III provides a detailed description of the procedures and techniques employed to collect the data. Chapter IV presents and discusses the findings derived from the data. Chapter V suggests possible conclusions derived from the findings and some direction for further study. References follow Chapter V. The appendices include: (A) Student Pre-, Mid-, and Post-Assessments; (B) Recorder Examples: Listening Portion of Assessment; (C) Parental Permission Letter; (D) Student Recorder Form; (E) Music Selections Used in Lessons; and (F) Sample Lesson Plans.

CHAPTER II

REVIEW OF LITERATURE

Providing effective instruction in the skill of reading music has always been a challenge for music educators. Early in the history of music education in the United States, Lowell Mason and others began grappling with the rote-note controversy. In the interim, a significant amount of research has been conducted in quest of identifying effective methods and approaches for teaching students to read notation. Learning theories have also been probed, but not to the extent of the methodology researched. While the literature review included many topics related to the present study, attention is given predominantly to two: learning theory and methodologies of teaching notation.

Learning Theory

A survey of the literature on learning theories suggested that cognitive load theory (CLT) in particular might provide a framework for designing instruction to simplify the process of learning to read music. Its emphasis on simplification is consistent with many approaches that music educators have taken, including such widely used methodologies as Kodàly.

CLT deals primarily with memory, the limitations of memory, and ways to mitigate those limitations. According to CLT, there are two distinct categories of memory, working and long term. The core of the theory is the cognitive system formed by the interaction of the two types of memory, and the way the system deals with instructional approaches and materials

(Ayers, 2006). Working memory (WM), also known as short term memory, processes information entering through the senses and can manage a very limited number of new, interrelated elements simultaneously (Sweller, n.d., p. 42). This limitation holds true for both storing and processing information (van Gog, Ericsson, Rikers & Paas, 2005, p. 74). Long term memory (LTM) stores schemas, which are "cognitive constructs [incorporating] multiple elements of information into a single element with a specific function" (Paas, Renkl, & Sweller, 2003, p. 2). The storage capacity of LTM is essentially unlimited and relatively permanent, and its schemas have the capacity to become highly automated (Chipperfield, 2006; Cooper, 1990).

Since there are severe limits on the amount of information WM can hold, the length of time it can hold that information, and the number of operations it can perform on the information, effective learning requires that it should be used efficiently, especially when introducing a complex task such as music reading (Van Gerven, 2003). This requires that the instructor be aware of the structure and limitations of WM in order to design instruction and choose materials that facilitate the incorporation of information into LTM in the form of schemas.

The information being held in WM is called cognitive load. CLT divides cognitive load into three categories: intrinsic, extraneous, and germane. Intrinsic cognitive load is the amount of working memory claimed by the interactivity of the elements currently being processed in WM (Chipperfield, 2006)—in other words, the demands being placed on WM capacity by the task at hand. Difficult or complex tasks impose a high intrinsic cognitive load, which is inherent to the task and cannot be modified by instructional design. Extraneous cognitive load, that is, demands on WM that are not relevant to the task at hand, does not contribute to learning and may be modified by instructional design (Chipperfield, 2006). Germane cognitive load is the demand

placed on WM by processing, construction, and automation of schemas (Sweller, Merrienboer, & Paas, 1998). It too can be modified by instructional design.

According to CLT, the three types of cognitive load are additive, and the combined load cannot exceed the limited resources of WM if learning is to take place. Once knowledge has been processed and stored in LTM's schemas, however, that information is acquired and automated. WM can then use that information with little conscious thought (van Gog et al., 2005).

The use of CLT theory in designing instruction has been investigated by researchers in multimedia, e-learning, and mathematics (Van Gog et al., 2005). Some of the practices tested were the substitution of aural for visual stimuli, addition of visuals relative to text (Tabbers, Martens, & Merrienboer, 2004), isolation of elements (Ayers, 2006), providing learners with cues (Sweller, 2006), and addition of hypertext links (Paas et al., 2003). In each of these studies, the purpose was to reduce extraneous cognitive load and thereby facilitate learning.

CLT and Music Reading

Music reading is generally acknowledged to be a highly complex task (McGregor, 1992) and as such would seem to be an appropriate area of investigation for researchers interested in CLT. On the contrary, the literature review undertaken for the present study uncovered no research directly pertinent to the efficacy of this approach. However, a number of practices similar to those discussed above have been tested in designing instruction in music reading. Although CLT is not formally identified as a theory being tested, the research is focused on identifying methodologies that ease the task of learning to read notation either through

simplification or prompts/reinforcement. These instructional techniques are consistent with the principles of CLT and are therefore relevant to the present study.

Adaptations investigated include altered rhythm notation, pitch notation, or both. Variations in rhythm notation have included, for example, the use of horizontal durational lines to denote rhythm, addition of beat markers, and methods based on the work of Kodàly and Edwin Gordon. Results of these investigations are mixed and have not yielded enough collective evidence to mark any one method as superior. Osborn (1966) found that new concepts of rhythm notation resulted in *some* success with a specific population, while an inconclusive outcome was found with the beat marker system (Gregory, 1972). The Kodàly method was examined with Gordon's concepts by Palmer (1976); neither experimental method was found to be clearly better than the other.

Gauthier and Dunn (2004) compared two approaches for teaching first grade children to read simple rhythms. The same musical materials were used for each of two intact classes; only the instructional approach varied. One class was taught using a traditional "subtractive approach," with the quarter note as the beat and eighth notes as subdivisions of the beat. The other class was taught by an "additive approach," with the eighth note taught as the "shortest sound" and the quarter note as the equivalent of two short sounds. The additive approach was found to be more effective ($p < .001$).

The effect of prompts on rhythmic sightreading ability was investigated by Salzberg and Wang (1989). In this pretest-posttest study, string students aged 8–16 individually read rhythmic exercises under four conditions: counting out loud, foot tapping, counting and tapping simultaneously, and having no prompt. For less experienced students (i.e., students whose LTM schema were less well developed), counting out loud was the most effective prompt. For more

advanced students, whose schemas had presumably achieved a higher degree of automation, there were no significant differences among the conditions.

Bebeau (1982) compared the effectiveness of teaching rhythm reading using a traditional approach versus a simplified speech cue method with 107 third grade students. The speech cue group made significantly greater gains from pretest to posttest than did the traditionally taught group. This would seem to indicate that simplification is effective in teaching rhythm reading.

A study by Persellin (1992), however, concluded that the students did not find the use of multiple modalities confusing. The study examined the effect of four rhythm presentation modalities—visual, auditory, kinesthetic, and a combination of all three—on the recall of rhythm patterns. An equal number (n = 70) of first, third, and fifth grade students were tested. The visual method was less successful with the first grade group, but older children learned equally well with all combinations of presentation modalities.

Shehan (1987) examined aural and visual approaches to rhythm reading, with specific reference to short-term retention. Students in second and sixth grades were asked to perform on a woodblock rhythms presented in four modes: audio-rhythm, audio-mnemonics, (audio) visual-rhythm, and (audio) visual mnemonics. It was found that the simultaneous use of auditory and visual channels facilitated learning and retention. This was true for both grade levels, although the older students learned the patterns much more quickly than the younger ones, regardless of mode. Shehan's results do not appear to support the effectiveness of CLT in teaching rhythm reading.

However, despite the mixed results yielded by research studies, the reseracher's interest in the idea of applying cognitive load theory to teaching students continued to be strong. Initial

interest in the present research project came about during participation in an Orff workshop. The presenter, Mary Helen Solomon, began a demonstration lesson on recorder with a visual of the music notation for all to read and play. The participants, quickly noting that the recorder part was on a two-line staff, asked about the notation. Solomon explained that her approach to teaching recorder in the classroom was begun with teaching the falling minor third pattern, *g* and *e*, rather than the usual *g*, *a*, and *b*. Solomon explained that she began using this approach after seeing a recorder book beginning with c^2 and a^1. "The falling minor third seemed like an excellent start, and I immediately began thinking about all the material in *Music for Children*, volume I—all of which is in *c* pentatonic. Here was material that could be immediately applied to the recorder" (M. H. Solomon, personal communication, June 24, 2008). Another compelling reason to begin this way, she explained, was that the children seemed more comfortable with their recorders. "When I tried it, I discovered that the children held the recorders more comfortably, having both hands on the instruments right away. Many just want to use that right hand. The balance of the instrument in their hands was better" (M. H. Solomon, personal communication, June 24, 2008). Solomon was also convinced that this approach to playing the instrument was better because of the mellower tone produced in the lower range of the instrument. In addition: the children blow more softly when practicing the lower notes, as they want to produce the low c^1; they can begin reading the bottom two lines of the treble staff immediately; and they can improvise and compose easily with g^1 and e^1 as there is no harmonic reference as with *do re mi* (g^1, a^1, b^1). These improvisations and compositions built on limited pitches work well with drone accompaniments, and it is easy to move into full pentatonic, hexatonic, and full diatonic scales (M. H. Solomon, personal communication, June 24, 2008).

An informal pilot study of the approach was conducted in the researcher's classroom, with the goal of improving the pupils' recorder performance. However, as the lessons proceeded, it appeared that the students were becoming better music readers—the only apparent difference in the instruction being that they had begun reading music with limited notation on a two-line staff. Reflecting upon the teaching process used with this group, it was concluded that the use of a simplified staff—an application of cognitive load theory—might be the explanation for the class' unusual progress in reading notation. The proposal for the present study was an outgrowth of the pilot.

CHAPTER III

METHODOLOGY

Purpose of the Study

The purpose of the study was to apply the principles of Cognitive Load Theory to teaching students how to read music within the process of learning to play the recorder. It was hypothesized that the use of CLT principles would improve accuracy and rate of learning. To facilitate the analyses of the data and the drawing of conclusions, the following null hypothesis was formulated.

Null Hypothesis: There will be no difference in the accuracy or rate of learning in students who are instructed using CLT principles and those instructed using the traditional holistic approach. Specifically, the following questions were posed:

- Will learners demonstrate a higher rate of accuracy with the application of CLT in the learning process?
- Will learners accomplish reading tasks more quickly with the application of CLT in the learning process?

Selection of Subjects

Subjects were 85 fourth-grade students attending elementary school in a metropolitan district in the southeastern United States. The subjects participated in the study while enrolled in four regularly scheduled music classes, which were part of an instructional cycle that included

music, art, physical education, and computer laboratory. Within this scheduling schema, classes in a particular subject met 40 minutes for five consecutive days. At the end of the five-day period, the students transferred to another subject in the cycle. In summary, 15 days elapsed before returning to study the initial subject in the cycle.

The four fourth-grade music classes were randomly assigned to serve as either the control or experimental group. The control classes comprised 42 students, 18 female and 24 male; the experimental classes contained 43 students, twenty-two female and twenty-one male (See Table 1). The sample was predominantly Caucasian students (90%). During the course of the study, three students withdrew from the school; data from their assessments were not included in the analysis.

Table 1.

Frequency Table of Group by Gender

	Female	Male	Total
Control	18	24	42
Experimental	22	21	43
Total	40	45	85

Subjects were required to submit written parental permission to take part in the study (See Appendix C). The study was approved by the University of Georgia Institutional Review

Board (IRB), which ensures that human subjects research is conducted in compliance with the applicable federal, state, and institutional policies and procedures.

Research Design

The experiment utilized a modified pretest/posttest design. Data were collected at three points: prior to the study, at the midpoint, and at completion. The same assessment instrument, designed by the researcher, was used to gather data at all three intervals. The researcher served as teacher/assessor for both experimental and control groups.

The instrument consisted of three sections: identification of notational symbols, listening discrimination, and recorder performance. The identification section required students to give the letter name of 10 notated pitches, and presented five multiple-choice questions that targeted knowledge of basic music symbols. The listening portion contained 10 two- and three-tone patterns. The subject was asked to match the aural pattern with the notation. The third portion of the assessment required each student, individually, to perform the given notated example on the recorder. The control classes read notation from a five-line staff with clef sign, key signature, and meter signature displayed. Notation for the experimental classes was written on a two-line staff without the clef, key, or meter signatures (See Appendices E11, E14, E16, E18, and E21).

Description of Experiment

With the exception of the visual presentation of the staff and notation, lesson plans for each group were identical (See Appendix F1 and F2). The 15-week experiment included the following steps:

* The researcher introduced each recorder piece by first singing it for the students.

* The students sang each piece by rote with solfège syllables and Curwen hand signs before learning and singing the text.

* After introduction of the staff, students read the rhythm of each new song using the Chêvé syllables, clapped the rhythm without the Chêvé syllables, sang the pitches with solfège, sang the letter names of the pitches while using the Curwen handsigns, and finally played it on the recorder.

Songs were presented to classes by projecting the notation on a screen in the front of the music room. As the children developed fluency performing the songs on recorder, the repertoire was alternately sung, played on the recorder, and performed with Orff instrument accompaniment provided by the researcher. The repertoire included folk songs “Cuckoo,” “Old House,” “Rain Rain,” and “Down in the Meadow,” as well as “Alleluia,” by Grace Nash (See Appendix E).

CHAPTER IV

FINDINGS, DISCUSSION, AND CONCLUSIONS

Findings

For each subject, raw scores were recorded for each section of the assessment, as well as the total score. The recorder portion of the assessment was omitted from the pretest, as recorder instruction had not yet been given. Twenty-five constituted a perfect score on the pretest. Total scores ranged from 0 to 20. Table 2 shows the range of total raw scores and the mean score on the pretest by class: Control 1 (C1), Control 2 (C2), Experimental 1 (E1) and Experimental 2 (E2).

Table 2.

Pretest Total Scores (Maximum 25)

	Raw Scores			
Group	Highest	Lowest	Range	Mean
C1	20	0	20	8.89
C2	12	4	8	8.96
E1	15	4	11	9.78
E2	11	4	7	7.32

Note. C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experimental 1; E2 = Class Experimental 2.

Midterm assessment total scores ranged from 0 to 14, with a perfect score being 30. Table 3 shows the range of total raw scores and the mean score by class for the midterm assessment.

Table 3.

Midterm Assessment Total Scores (Maximum 30)

	Raw Scores			
Group	Maximum	Minimum	Range	Mean
C1	14	1	13	4.16
C2	9	1	8	4.86
E1	5	0	5	2.68
E2	5	0	5	2.07

Note: C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experimental 1; E2 = Class Experimental 2.

Posttest total scores varied from 4 to 28. The maximum possible score on the posttest was 30. Table 4 shows the range of total raw scores and the mean score by class for the posttest.

Table 4.

Posttest Total Scores (Maximum 30)

	Raw Scores			
Group	Maximum	Minimum	Range	Mean
C1	28	8	20	13.42
C2	28	10	18	17.77
E1	17	4	13	10.77
E2	20	6	14	10.89

Note. C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experiment 1; E2 = Class Experiment 2.

On the identification section of the assessments, raw scores ranged from 0 to 11 on the pretest, 0 to 10 on the midterm assessment, and 0 to 15 on the posttest. Class means for this section were from 1.58 to 2.35 (pretest), 2.07 to 4.86 (midterm assessment), and 2.59 to 7.18 (posttest). Table 5 shows the range of raw scores and the mean score by group on the identification section of the assessment.

Table 5.

Identification Section: Range of Raw Scores (Maximum 15) and Mean Scores by Group for All Assessments

	Pretest (Y1)		Midterm Assessment (Y2)		Posttest (Y3)	
Group	Range	Mean	Range	Mean	Range	Mean
C1	0 - 11	2.21	1 - 14	4.16	1 - 15	3.68
C2	0 - 5	2.35	1 - 9	4.86	2 - 15	7.18
E1	0 – 5	2.13	0 - 5	2.68	0 - 5	2.59
E2	0 – 3	1.58	0 - 5	2.07	0 - 9	2.89

Note. C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experimental 1; E2 = Class Experimental 2.

On the listening section of the assessments, raw scores ranged from 0 to 14 on the pretest, 1 to 10 on the midterm assessment, and 3 to 10 on the posttest. Class means for this section were from 2.07 to 4.86 (pretest), 7.00 to 7.82 (midterm assessment), and 7.00 to 8.21 (posttest). Table 6 shows the range and mean for each group in the study.

Table 6.

Listening Section: Range of Raw Scores (Maximum 10) and Mean Scores by Group for All Assessments

	Pretest (Y1)		Midterm Assessment (Y2)		Posttest (Y3)	
Group	Range	Mean	Range	Mean	Range	Mean
C1	0 - 14	4.16	3 - 10	7.74	4 - 10	8.21
C2	0 - 9	4.86	5 - 10	7.36	4 - 10	7.77
E1	0 – 5	2.68	0 - 5	7.82	3 - 10	7.09
E2	0 – 3	2.07	0 - 5	7.00	3 - 10	7.00

Note. C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experimental 1; E2 = Class Experimental 2.

The recorder portion of the assessment was given only twice; it was omitted from the pretest because students had received no instruction on the instrument prior to the study. Scores ranged from 0 to 3 on the midterm assessment and 0 to 5 on the posttest. Maximum score on this section was 5. Table 7 shows the range of scores and mean score for each group on both assessments.

Table 7.

Recorder Section: Range of Raw Scores (Maximum 5) and Mean Scores by Group

	Midterm Assessment (Y2)		Posttest (Y3)	
Group	Range	Mean	Range	Mean
C1	0 - 3	1.63	0 - 3	1.53
C2	0 - 3	1.32	1 - 5	2.64
E1	0 - 2	1.23	0 - 3	1.18
E2	0 – 2	0.73	0 - 3	1.00

Note. C1 = Class Control 1; C2 = Class Control 2; E1 = Class Experimental 1; E2 = Class Experimental 2.

Since the design of the study did not control for prior knowledge and experience of individual students, it was necessary to examine the differences between rather than within assessments. Students with music reading knowledge prior to the study would likely have higher scores on all three assessments than learners with little or no prior music reading knowledge.

Between the pretest (Y1) and the midterm assessment (Y2), the control groups showed a mean gain of 2.24 on the identification section (I), while the experimental groups had a mean gain of 0.50. Mean gains from Y1 to Y2 on the listening section (L) were 0.90 for the control

groups and 0.89 for the experimental groups. Between the midterm assessment (Y2) and the posttest (Y3), mean total gains (including identification, listening, and recorder (R) sections) were 2.22 for the control groups and 0.17 for the experimental groups. Finally, between Y1 and Y3 the control students posted mean score gains of 3.26 on the identification section and 1.34 on the listening section, with the experimental group showing mean gains of 0.87 for the identification section and 0.29 for the listening section (See Table 8).

Table 8.

Mean Score Gains (or Losses) Between Assessments, by Group

Assessment	Group	Mean Gains (Losses)			
		Identification (ID)	Listening (L)	Recorder (R)	Total (ID+L+R)
Y2-Y1	Control	2.24	0.90	N/A	N/A
	Experimental	0.50	0.89	N/A	N/A
Y3-Y2	Control	1.02	0.43	0.66	2.22
	Experimental	0.46	(-0.37)	0.14	0.17
Y3-Y1	Control	3.26	1.34	N/A	N/A
	Experimental	0.87	0.29	N/A	N/A

Note. Y2 - Y1 = Difference between Midterm and Pretest Scores; Y3 –Y2 = Difference between Posttest and Midterm Scores; Y3 – Y1 = Difference between Posttest and Pretest Scores.

While the main interest of this study was to examine the efficacy of the application of CLT to the teaching of music reading, two secondary variables were present: gender and ethnic background. Although ethnic background was recorded for each student, the study population

was predominantly Caucasian, with less than 10% of African, Asian, or Hispanic descent. Therefore, it was not feasible to include ethnic background in the statistical analysis.

Results from the ANOVA analysis are displayed in Tables 9, 10, and 11. If a variable was determined to be a significant factor in improvement, the least square means (LSM) of improvement is stated for each group. If the groups were shown to be equal, the separate LSM are not shown. The LSM of the group are the means of improvement of the different teaching methods after controlling for gender. Comparable results are listed for gender and the interaction, group*gender. A significance level of 0.05 was used throughout the analysis.

The sections common to all three assessments were identification and listening. The total (T1) of those two scores was utilized to analyze the growth of knowledge in these two areas. Table 9 contains results of the ANOVA analysis of the pretest and midterm assessment scores controlling for gender.

Table 9.

ANOVA Analysis of Data: Pretest and Midterm Assessments (Y2 - Y1)

	T1(ID+L)	ID	L	R	T(ID+L+R)
Group	S LS_C=3.20 LS_T=1.39	S LS_C=2.28 LS_T=0.50	NS	N/A	N/A
Gender	NS	NS	MS LS_F=0.44 LS_M=2.36	N/A	N/A
Group*gender	S LS_CF=3.61 LC_CM=2.78 LS_TF=0.22 LS_TM=2.56	NS	S LS_CF=1 LS_CM=0.83 LS_TF=0.11 LS_TM=1.89	N/A	N/A

Note: T1(ID+L)=Total score on Listening and Identification; ID=Identification score; L=Listening score; R=recorder score; T(ID+L+R)= Total score of Identification, Listening and Recorder

S=significant; NS=non-significant; MS=marginally significant (0.005<p-value<0.1)

LS_C = Least square means of control group

LS_T = Least square means of experimental group

LS_CF = Least square means of control for female

LS_CM = least square means of control for male

LS_TF = Least square means of experimental for female

LS_TM = Least square means of experimental for male

Analysis of the pretest and midterm (Y2–Y1) assessment scores shows a significant variance of the group*gender interaction, with the male students having a smaller difference between experimental and control. Although the females' scores show a significant difference (CF=3.61 to TF=0.22), the experimental group had lower LSM than did the control. On the whole, the control group showed significantly greater improvement than the experimental group. The males in the experimental group had a LSM of 2.56, while that of the control group males was 2.78.

Table 10 displays the outcome of the ANOVA analysis of midterm and posttest scores controlled by gender. The Recorder section of the assessment was given on these two assessments; the Total score included students' achievement on this section. Some trends in achievement are visible in Table 10.

Table 10.

ANOVA Analysis of Data: Midterm and Posttest Assessments (Y3 – Y2)

	T1(ID+L)	ID	L	R	T(ID+L+R)
Group	MS LS_C=1.44 LS_T=0.07	NS	MS LS_C=0.44 LS_T=0.39	NS	S LS_C=1.28 LS_T=1.06
Gender	NS	NS	NS	NS	NS
Group*gender	NS	NS	NS	NS	NS

Note: T1(ID+L)=Total score on Listening and Identification; ID=Identification score; L=Listening score; R=recorder score; T(ID+L+R)= Total score of Identification, Listening and Recorder

S=significant; NS=non-significant; MS=marginally significant (0.005<p-value<0.1)

LS_C = Least square means of control group LS_CM = least square means of control for male

LS_T = Least square means of experimental group LS_TF = Least square means of experimental for female

LS_CF = Least square means of control for female LS_TM = Least square means of experimental for male

Examining the differences between posttest and midterm assessment scores (Y3–Y2) shows that the relationship between scores and group effect was not significant. The groups did not differ by gender. The scores by group varied with only marginal significance, with the control LSM 1.44 and the experimental LSM 0.07.

In order to find the overall growth of knowledge, posttest and pretest scores were analyzed, again controlling for gender. As the Recorder section was not administered on the pretest, scores from the posttest did not include the final Recorder scores. Table 11 contains the results of this ANOVA analysis.

Table 11.

ANOVA Analysis of Data: Midterm and Posttest Assessments (Y3 – Y2)

	T1(ID+L)	ID	L	R	T(ID+L+R)
Group	S LS_C=4.64 LS_T=1.21	S LS_C=3.29 LS_T=0.89	MS LS_C=1.35 LS_T=0.32	N/A	N/A
Gender	NS	NS	NS	N/A	N/A
Group*gender	NS	NS	NS	N/A	N/A

Note: T1(ID+L)=Total score on Listening and Identification; ID=Identification score; L=Listening score; R=recorder score; T(ID+L+R)= Total score of Identification, Listening and Recorder

S=significant; NS=non-significant; MS=marginally significant (0.005<p-value<0.1)

LS_C = Least square means of control group

LS_CM = least square means of control for male

LS_T = Least square means of experimental group

LS_TF = Least square means of experimental for female

LS_CF = Least square means of control for female

LS_TM = Least square means of experimental for male

In testing overall growth (Y3–Y1), the LSM showed, again, no effect by gender, but significant growth by group, the control group having a greater LSM (4.64) than the experimental group (1.21).

In the analysis of the identification section of the assessment, Y2–Y1 shows a significant group effect (C=2.28, T=0.50), as does Y3–Y1 (C=4.64, T=1.21). In both of the above, the control group showed greater growth. The listening scores illustrate a parallel trend. In checking the LSM of Y3–Y2 (C=0.44, T=0.39) and Y3–Y1 (C=1.35, T=0.32), the control group achieved greater improvement, but with only marginal significance. The marks of Y2–Y1 show the group effect was not significant, but the interaction of group*gender was. The control group females' LSM was greater, but the males' LSM was greater in the experimental group.

The recorder part of the assessment was not administered during the pre-assessment, allowing only a comparison between Y3 and Y2. No significant difference was found between groups, or the experimental effect was not significant in the second half of the experimental period. The total score (identification + listening + recorder) shows a significantly higher LSM for the control classes for the second half of the study.

In summary, students in the control classes achieved higher scores on the identification portion of the assessment. The students responded differently to the listening portion by group in the first half of the experiment, but that difference disappeared by the end of the study. The control students also showed greater improvement in learning to read music overall than the students in the experimental classes. There was no appreciable difference between groups or gender on the recorder portion of the assessment. Thus the null hypothesis was accepted.

Discussion

In this study, the traditional method of teaching fourth grade students to read music notation yielded better results than the application of Cognitive Load Theory to the teaching of music reading. A number of factors could have affected those results. The assignment of classes to control and experimental groups was random, but the assignment of students to the four individual classes was predetermined. The four classes contained students of a mixture of ability levels, and the classroom teachers varied in experience and management style, which had an effect on student behavior and level of attention in the music class. Furthermore, repeating essentially the same test three times may have affected the results, as the researcher observed that some students appeared to lose interest as the study progressed.

As an informal continuation of the study, the researcher collected further data midyear of the following school year. The same assessment was given to the students, now in fifth grade. The students were grouped differently, so scores from students in the control classes both years were compared to students belonging to experimental classes both years. The experimental group contained 24 students while the control group included 14. Scores from this assessment were compared to those from the pretest and posttest from the preceding year. The scores were disaggregated exactly as in the previous year.

As in the main study, the control group scored achieved higher mean scores than the experimental group. Scores from the control group demonstrated growth in musical knowledge. The scores on the identification section rose from 2.07 to 7.5 mean correct, a mean increase of 5.43, while the total mean scores increased from 7.64 to 17.3, improving by 9.66. The control group also showed growth, from a mean score of 1.75 to a mean of 6.08 on the identification

portion and an increase in the mean total score from 8.79 to 15.96. The only experimental group means that were higher than those of the control group were on the first and final listening portions and the first total score.

While the data support the use of the traditional approach to teaching music reading, some students appeared to appreciate the approach used in the experimental classes. Those identified at-risk students were observed to be focused on the visuals and working during lessons. This was a marked difference from previous lessons and years, when off-task behaviors were common. A common problem with recorder instruction is hand positions. Most students' dominant hand is the right one, while proper hand position for the recorder calls for the left hand to be placed at the top. Music educators have developed numerous methods for reminding students of correct hand placement. These range from slap-band bracelets, stickers and inked designs, to ribbons or stretchy "left hand on top" bracelets worn on the left hand or wrist. Students in the experimental groups needed very few reminders concerning hand positions, far fewer than the students in traditional teaching who begin with the notes g, a, and b. The experimental groups also seemed to produce a pleasing sound more quickly than those taught by the traditional method. This is perhaps due to the use of the lower register on the instrument from the start of instruction. The lower range on the recorder requires the gentlest air stream, so utilizing this lower range requires students to control their breath from the very beginning.

Conclusion

The results of this study indicate that the traditional method of teaching music reading is more effective than an approach based on Cognitive Load Theory. While the assessment scores support this finding, the researcher will continue to use aspects of the CLT model in the music

classroom. Students in this study who began the recorder with the notes *e* and *g* attained better hand positions more quickly that those who began with the standard *g-a-b* approach. The addition of the solfège practice, singing, and hand signs were valuable training for the students, improving their vocal and listening skills.

Changes to several aspects of this study may have produced different results. Assigning students to group, control or experimental, rather than assigning classes to a group might possibly mitigate the effects of the classroom teachers' experience and management style. Allowing more time for the research, as much as the whole of fourth and fifth grade years, may yield different results. The end result of this study may help music educators understand why none of the many attempts to simplify learning to read music have ever become accepted approaches in general music pedagogy.

Recommendations for Further Study

Since the researcher observed positive results from applying CLT in teaching music reading, but the results were not statistically supported, the following suggestions for further study are offered:

1. Conduct a similar study with a larger number of students over a longer period of time; perhaps a network of teachers might cooperate.

2. Repeat the study using a random selection of students as well as random class selection.

3. Include variance of age, musical background, IQ, and GPA in the analysis of data.

4. Investigate whether or not the students perceived learning to be easier/more pleasurable when CLT was applied.

5. To gain further insight into student attitudes and motivation, randomly conduct period progress checks and interviews.

6. Repeat the study and test music reading knowledge aurally by grading students' recorder playing.

7. Investigate differences in teaching recorder using G, A, and B first as compared to E and G as first notes learned.

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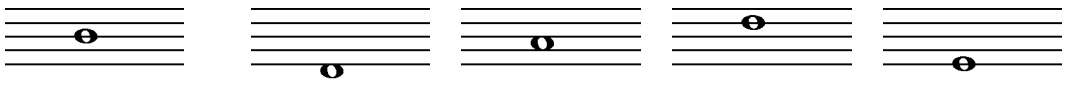
APPENDIX A

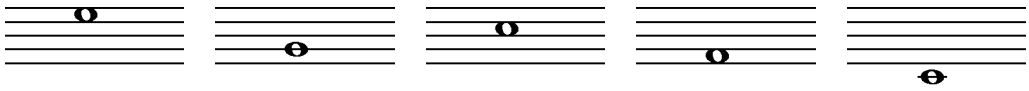
STUDENT PRE-, MID-, AND POST-ASSESSMENT

Name _____ Class _____

Name the following notes by writing the name on the line below the note.



1. _____ 2._____ 3. _____ 4. _____ 5. _____

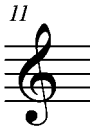


6. _____ 7. _____ 8. _____ 9. _____ 10. _____

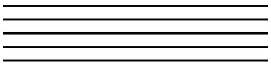
APPENDIX A (continued)

STUDENT PRE-, MID-, AND POST-ASSESSMENT

Identify the following music symbols by circling the best answer.



11. a. meter signature
b. treble clef
c. flat
d. sharp



12. A. flat
b. half note
c. staff
d. meter signature

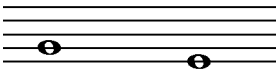
13. A. treble clef
b. staff
c. flat
d. sharp

14. a. staff
b. flat
c. whole note
d. meter signature

15. A. treble clef
b. quarter note
c. flat
d. meter signature

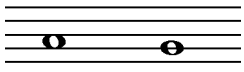
Listen to 2 short patterns and then circle the number that matches the written music.

A.



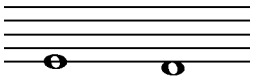
1 or 2

B.



1 or 2

C.

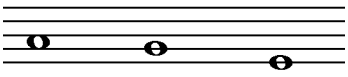


1 or 2

APPENDIX A (continued)

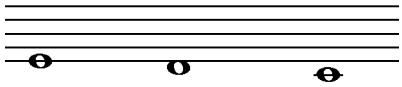
PRE-, MID-, AND POST-ASSESSMENT

D.



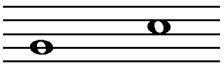
1 or 2

E.



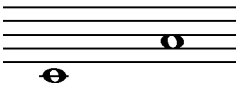
1 or 2

F.



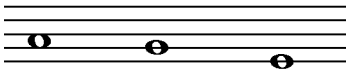
1 or 2

G.



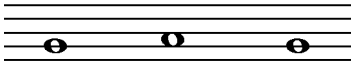
1 or 2

H.



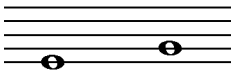
1 or 2

I.



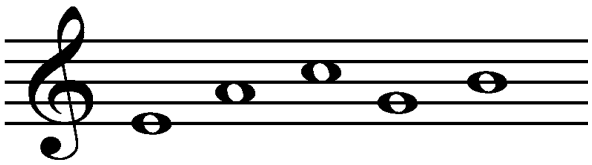
1 or 2

J.



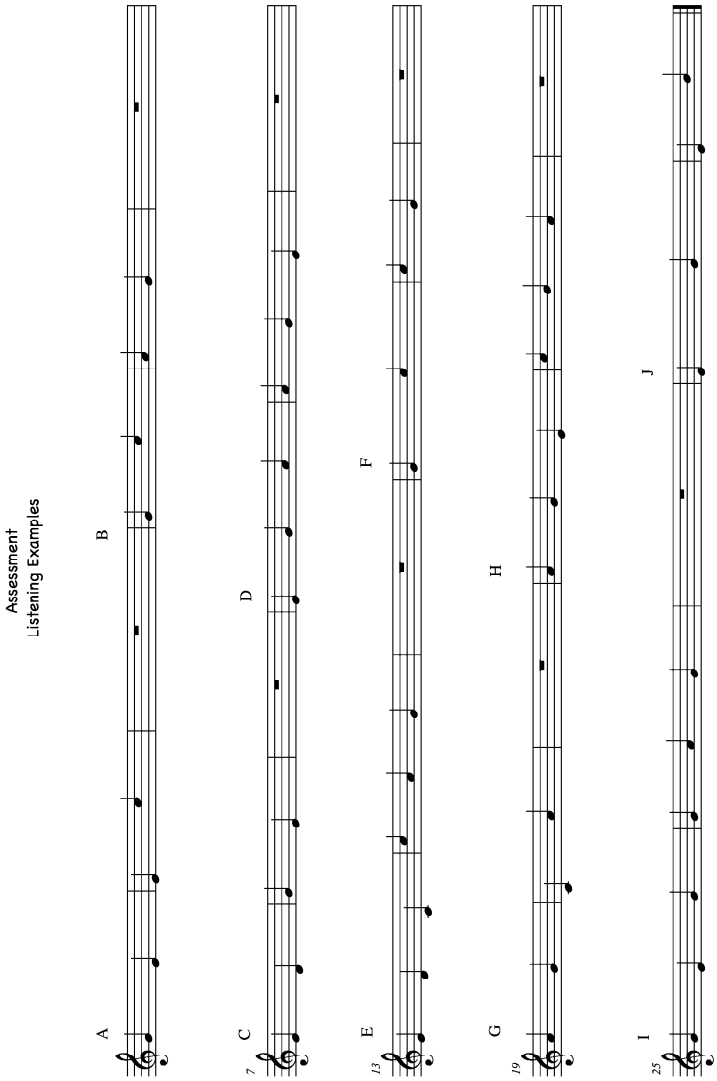
1 or 2

Recorder piece



APPENDIX B

RECORDER EXAMPLES FOR LISTENING PORTION OF ASSESSMENT



APPENDIX C

PARENTAL PERMISSION LETTER

15 December 2008

Dear Parent or Guardian,

I am writing to tell you about a research project I need to conduct with the fourth grade at XXXX Elementary School. I am a graduate student at UGA and this study will complete my work toward the Doctor of Education in Music Education.

In my studies at UGA, I have searched for a better way to teach elementary students to read music so that students will learn to read music better and more easily. The four fourth classes will be randomly assigned to either a experimental or control group. Assessments will include a listening portion, a written identification of music symbols and notation, and a basic sight-reading section on their recorder. These assessments will in no way affect their music grades. They are for use in my research study only.

In planning this research I have spoken with both Mr. XXXXXXX, principal of XXX Elementary, and XXXXXXXX, assistant principal, as well as with my advisor at UGA, Dr. Mary Leglar. All have given their guidance and support as I've planned this exciting project.

Please feel free to call (000 000-0000) or email me (sylvia.price@xxxxxxxx) if you have any questions. Please read, sign and return the consent form at the bottom of this letter.

Thank you for your continued support of the music program and Lula Elementary.

XXXXXXX
Principal
XXX Elementary

Sylvia T. Price
Music Specialist
XXX Elementary

Please read, sign, and return this bottom portion to Mrs. Price.

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

I understand my child's class will be assigned to either the control or experimental group as a part of Mrs. Price's research project required by her degree program at the University of Georgia. I also understand my child's Music grade will not be affected by his or her participation in this study.

I give my consent for my child to take part in the music reading/recorder research study at XXXX, 6 January through 14 April 2009.

Signature_____date_____

APPENDIX D

STUDENT RECORDER FORM

Student Recorder Form

As you learn to play the recorder, I will also teach you how to read music notation, or written music. Some of our fourth grade classes will learn the regular way, the way I learned to read music, but some classes will be taught a new way.

Would you be willing to help me as I try teaching reading music this new way? It will be an interesting project, and I need help from students to do it. I will ask you to take a pre-test to help me plan what I need to teach. I will also ask you to take a test half way through my study, and again at the end. These mid-term and post-tests will help me know how much you have learned.

The pre-, midterm, and post-tests will not affect your Music grade in any way. They are just to help me know how much you learn, so I can figure out if my new way is better than the regular way of teaching reading music.

Do you have any questions? Would you be willing to do this project with me?

_____ _____

Student's signature

Homeroom Teacher

APPENDIX E

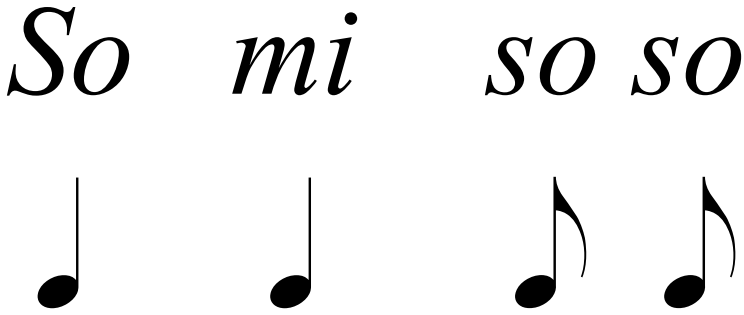
CUCKOO, SO MI

So mi so so mi

So mi so so mi

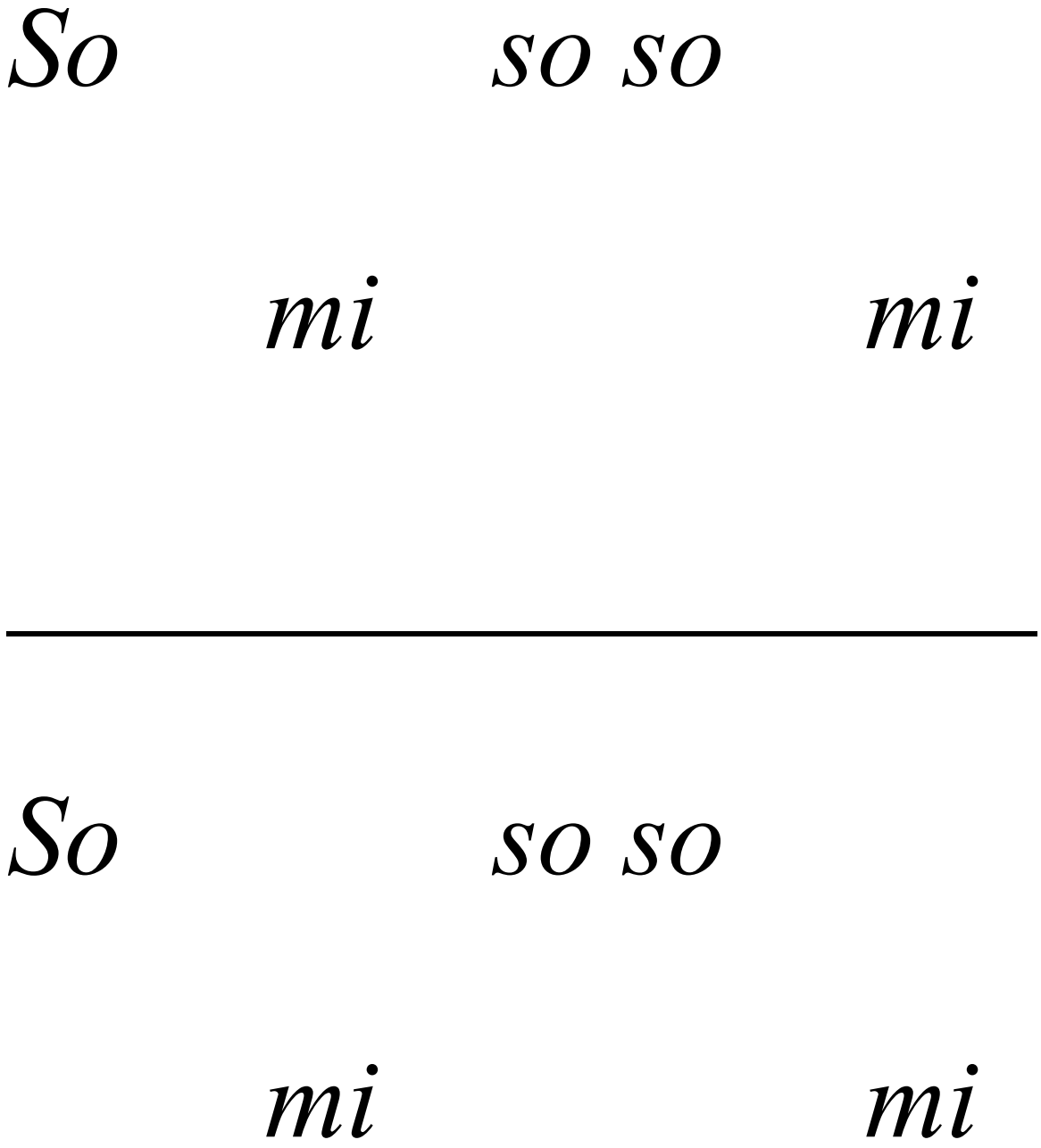
APPENDIX E (continued)

CUCKOO, SO MI WITH RHYTHM



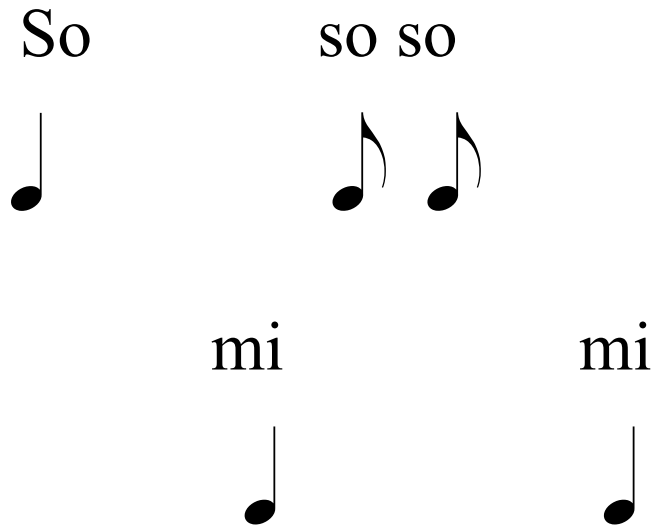
APPENDIX E (continued)

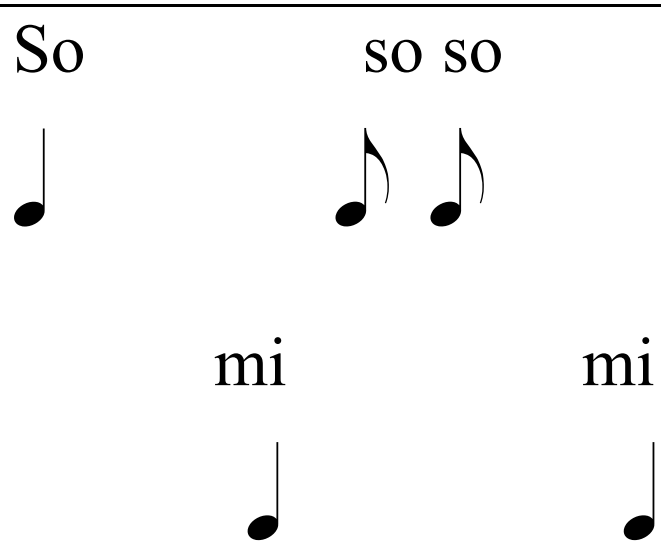
CUCKOO, SO MI WITH HIGHER/LOWER PLACEMENT



Appendix E (continued)

CUCKOO, SO MI WITH RHYTHM, AND HIGHER/LOWER PLACEMENT





APPENDIX E (continued)

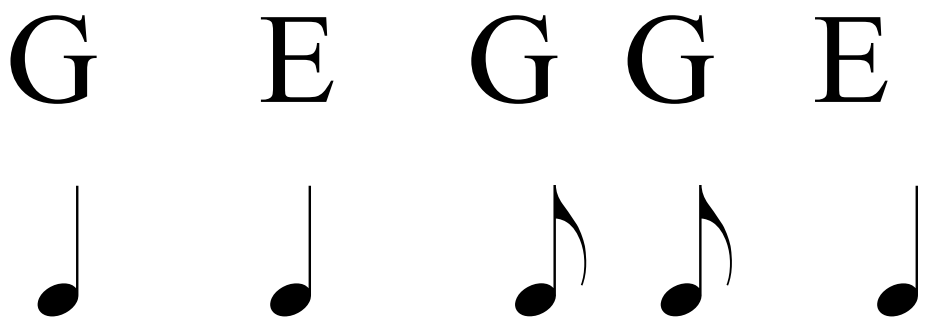
CUCKOO, NOTE NAMES *(G, E)*

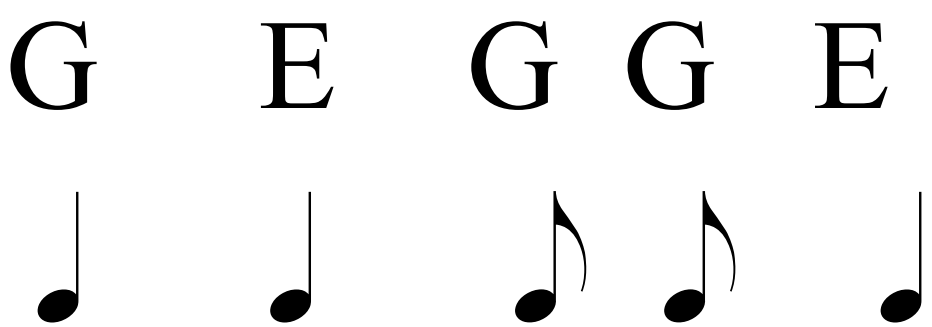
G E G G E

G E G G E

APPENDIX E (continued)

CUCKOO, NOTE NAMES *(G, E)* WITH RHYTHM





APPENDIX E (continued)

CUCKOO, NOTE NAMES *(G, E)* WITH HIGHER/LOWER PLACEMENT

G G G

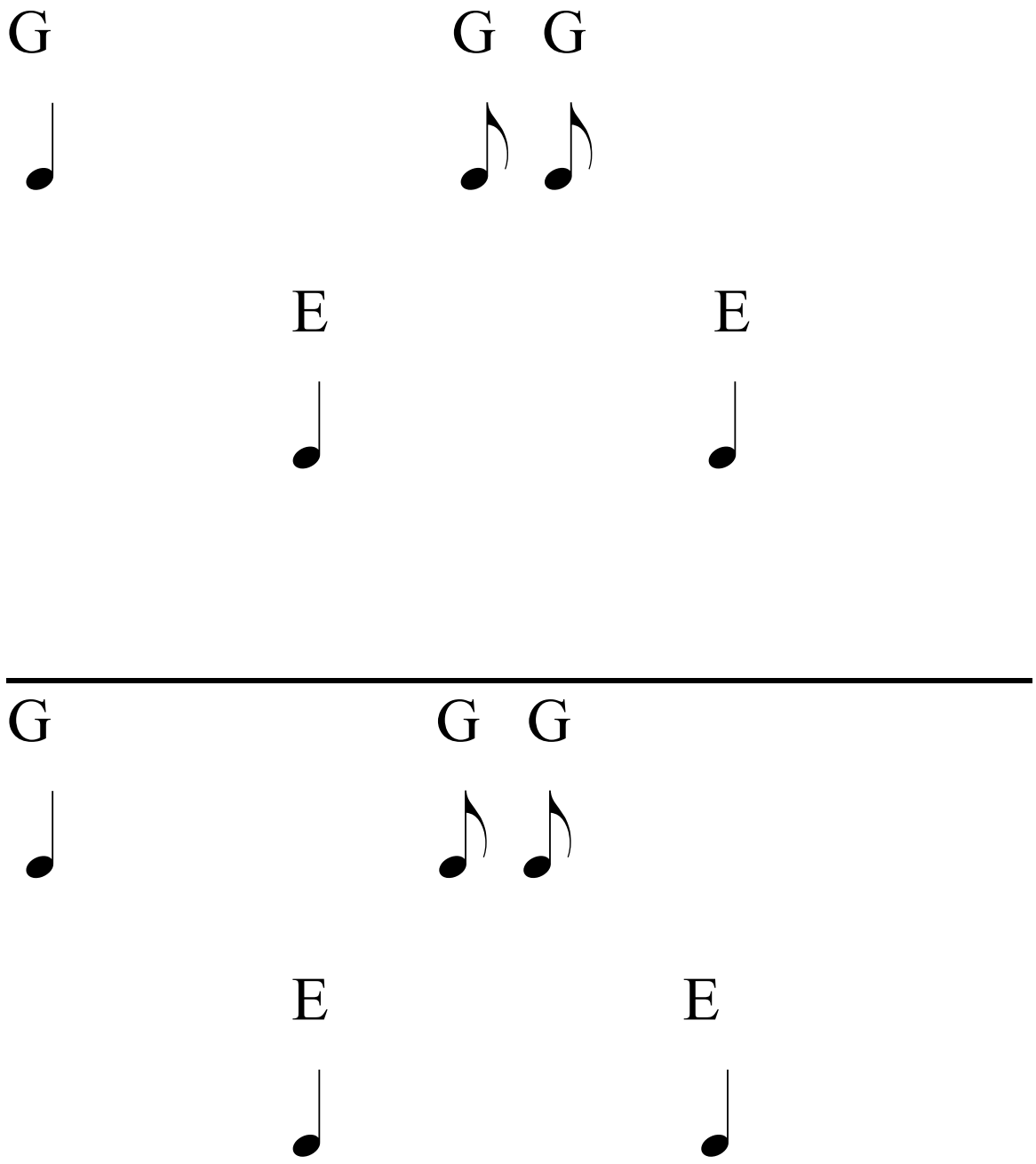
E E

G G G

E E

APPENDIX E (continued)

CUCKOO, NOTE NAMES *(G, E)* WITH RHYTHM, AND HIGHER/LOWER PLACEMENT

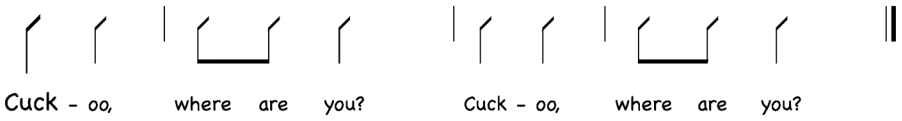


APPENDIX E (continued)

CUCKOO, NOTE NAMES *(G, E)* SONG WITH RHYTHM AND TEXT

Cuckoo

traditional

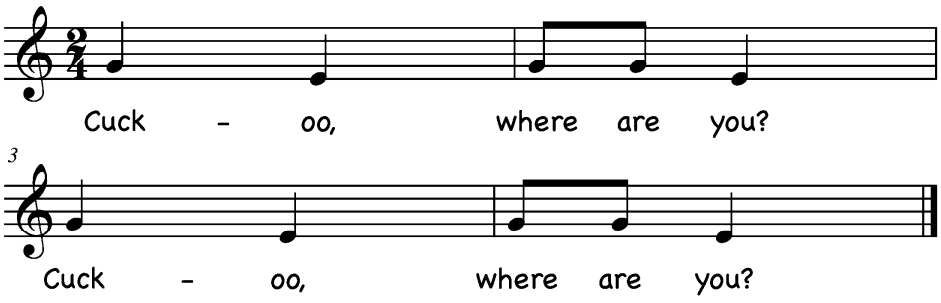


APPENDIX E (continued)

CUCKOO MELODY (CONTROL)

Cuckoo

traditional

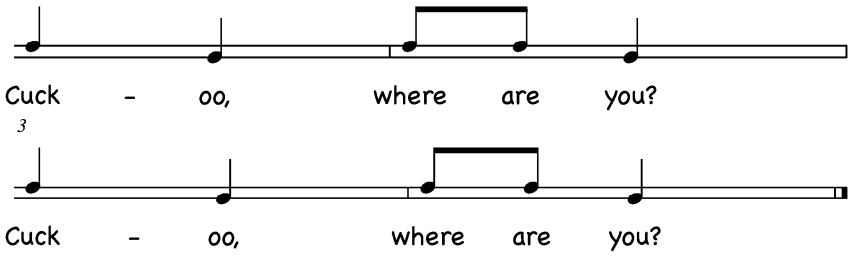


APPENDIX E (continued)

CUCKOO MELODY (EXPERIMENTAL)

Cuckoo

traditional

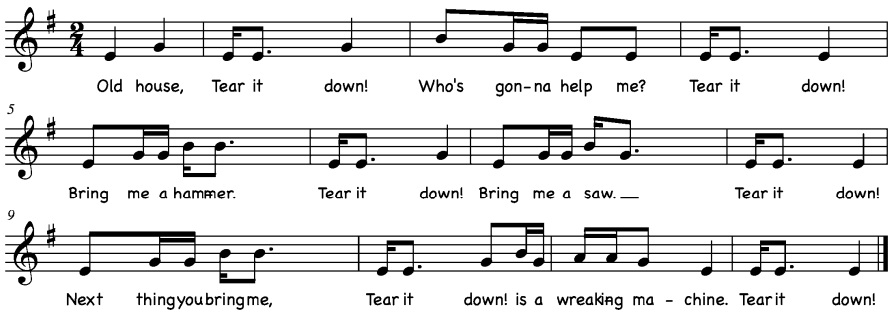


APPENDIX E (continued)

OLD HOUSE MELODY WITH TEXT

Old House

African American Game Song



New house. Built it up!
Who's onna help me? Build it up!
Bring me a hammer. Build it up!
Bring me a saw. Build it up!
Nest thing you bring me, Build it up!
is a carpenter man. Build it up!

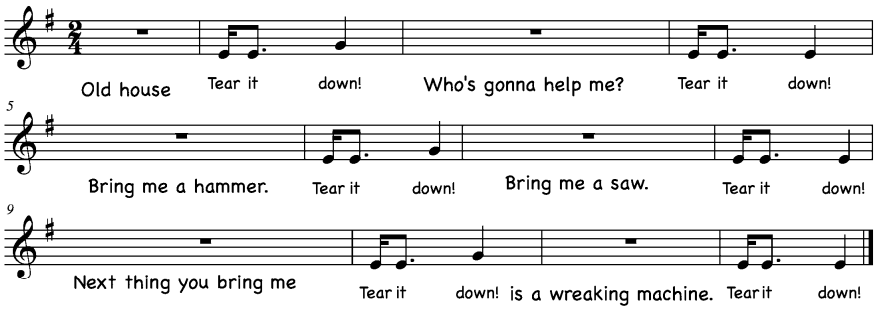
collected by John W. Work

APPENDIX E (continued)

OLD HOUSE NOTATION (CONTROL)

Old House

African American Game Song

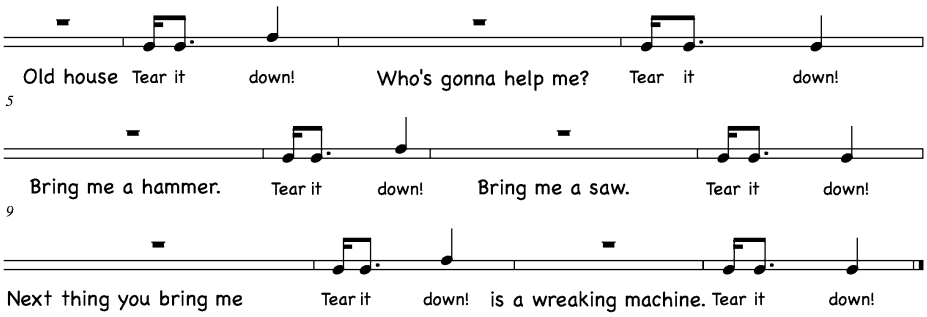


APPENDIX E (continued)

OLD HOUSE NOTATION (EXPERIMENTAL)

Old House

African American Game Song

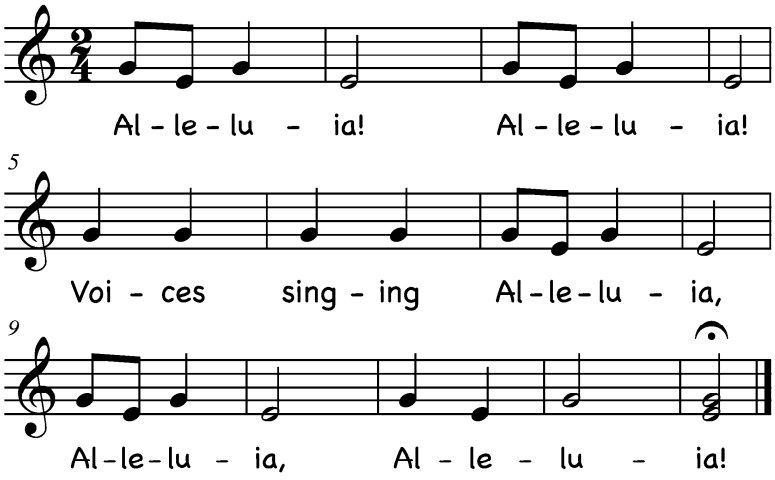


APPENDIX E (continued)

ALLELUIA MELODY (CONTROL)

Alleluia

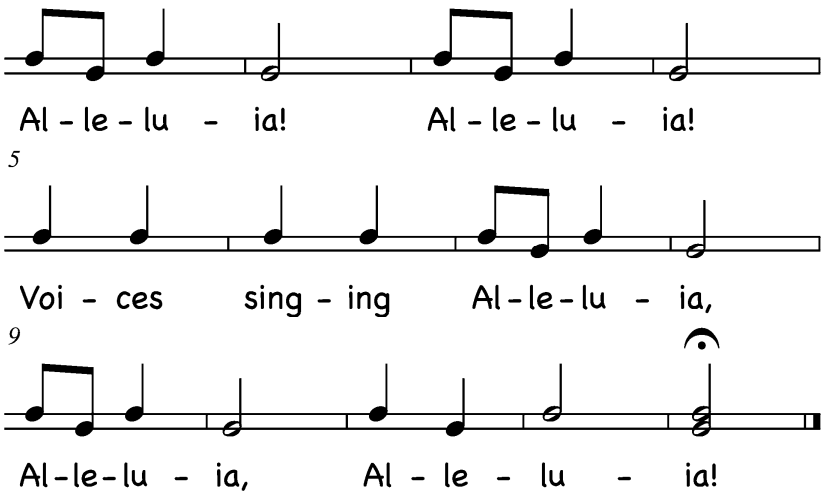
Grace Nash



ALLEULIA NOTATION (EXPERIMENTAL)

Alleluia

Grace Nash

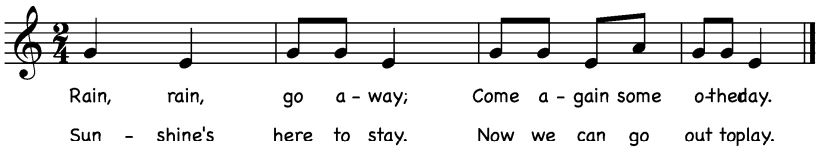


APPENDIX E (continued)

RAIN, RAIN MELODY (CONTROL)

Rain, Rain

Traditional

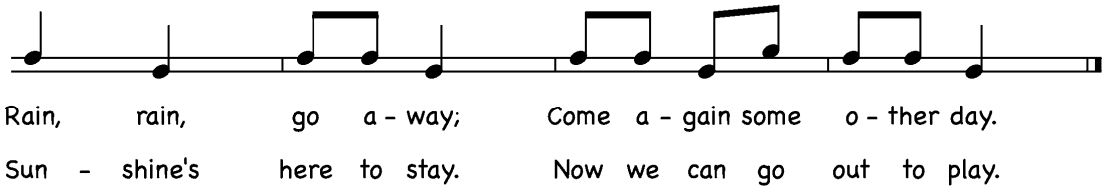


APPENDIX E (continued)

RAIN, RAIN (EXPERIMENTAL)

Rain, Rain

Traditional

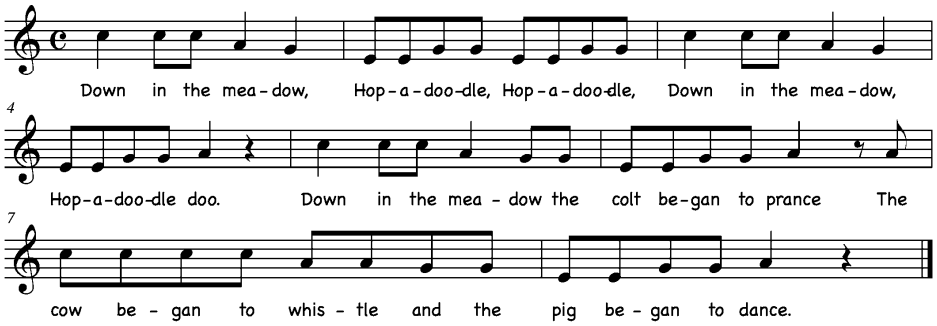


APPENDIX E (continued)

DOWN IN THE MEADOW MELODY WITH TEXT

Down in the Meadow

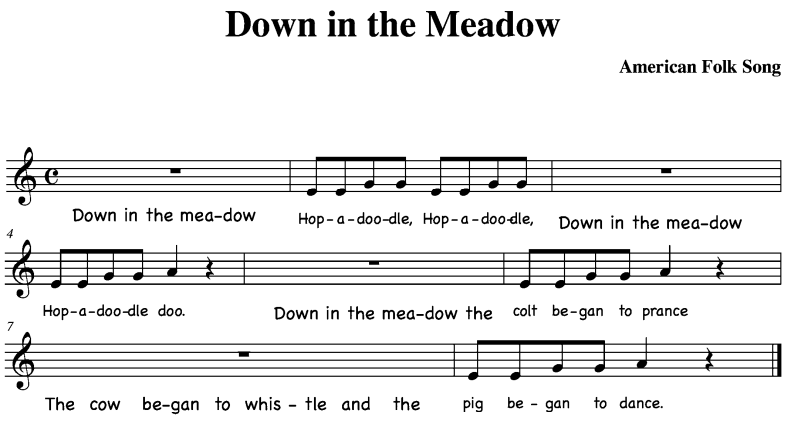
American Folk Song



Down in the barnyard, Hop-a-doo-dle, Hop-a-doo-dle,
Down in the barnyard, Hop-a-doo-dle doo.
Down in the barnyard the goose began to sing.
The hen began to cackle as the rosoter flapp'd a wing.

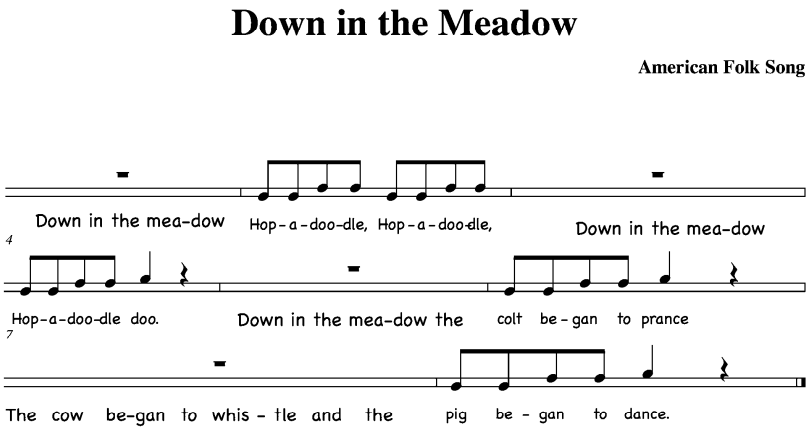
APPENDIX E (continued)

DOWN IN THE MEADOW MELODY (CONTROL)



APPENDIX E (continued)

DOWN IN THE MEADOW (EXPERIMENTAL)



APPENDIX F

EXAMPLE LESSON PLAN (EXPERIMENTAL)

Recorder Music Lesson Plan 1
4th grade – Treatment Group

Conceptual Objective	Materials	Procedure	Evaluation
1. Pitch is highness or lowness of sound. 2. Tonal movement may progress by step, skip, or repetition. **Behavioral Objective** TSW play g^1 and e^1 on the recorder with 80% accuracy when playing *Cuckoo*.	1a. Lummi sticks 1b. *Cuckoo* from TKM – 166 1d-l. Timmons' notes [from AOSA conference] * 1d. Flanders Recorder Quartet: *Galliard*, *Courant* from *The Nations* CD 1ij. *Solfège* syllables 1ij. Curwen hand signs	1a. *intro recorder poster, naming parts of instrument, brief history of recorder* 1b. Echo/speak *Cuckoo* in rhythm, echo/sing with *solfège* syllables and hand signs T1 1c. show/discuss visual with *solfège* notation; sing T3 1d. C. mirror T., C. mirror partner T2 1e. C. reverse-mirror T., reverse-mirror partner 1f. Add lummi sticks – C. reverse-mirror partner T4 1g. All reverse-mirror T. 1-hand, then 2-hands on stick, hands in correct recorder position (tap each hand on stick, then each finger) 1h. introduce: warm-up position: warm recorder in left armpit (reduces condensation) ready position: chin supports in practice position blowing: experiment with amount, speed of air articulation: use "t" tongue to "speak" rhythm of *Cuckoo*, quieter each time until silent tonguing achieved embouchure: lips cover teeth, seal around mouthpiece	documented teacher observation **QCC** 1, 8, 10, 19, 21, 23 **NSME** 1, 2, 5, 6, 7
Entry Level			**Taxonomy**
Melody: high/low; high/low patterns; movement up, down, or repeat; movement by step, skip, repeat; wide/narrow range **Rhythm:** beat; tempo; meter; even/uneven division; duration may be same as beat, shorter, or longer **Harmony:** created by 2 or more sounds made simultaneously **Form:** motive; phrase; repetition/contrast (AB, ABA, Rondo) **Style:** patriotic, lullaby, folk, canon **Expression:** timbre; dynamics; accent groupings, melodic rhythm, movements of rhythmic patterns	1opq. White board 1opq. Overhead projector Transparencies: 1opq. *Cuckoo* written in *solfège* syllables (indicating high/low) 1opq. *Cuckoo* written with *e*, *g* (indicating high/low) 1opq. *Cuckoo* on 2-line staff with *e*, *g* 2. *Cuckoo* on 2-line staff, pitches notated with note heads	1i. echo/play e^1; C. identify as *so* or *mi* T1 1j. echo/play g^1; C. identify as *so* or *mi* T1 1k. echo/play patterns of e^1, g^1 1l. *walk, blow single notes as long as possible (e^1, then g^1) 1m. echo/sing: *solfège* leader sings neutral syllable, C. respond w/*solfège* leader sings note name, C. respond w/ same, fingering note leader sings neutral syllable, C. respond playing recorder T2 1n. echo/play *Cuckoo* 1o. show/discuss visual with *solfège* notation; play T3 1p. show/discuss visual with *e*, *g* with high/low; play T3 1q. show/discuss 2-line staff with *e*, *g*; play T4 2. show/discuss 2-line staff with note heads; identify with *so*, *mi*; sign/sing; play T5 discuss storage procedure *SUMMARY: Brief review of embouchure, hand positions, fingerings for e and g, positions on staff*	T1 Knowledge T2 Comprehension T3 Application T4 Analysis T5 Synthesis T6 Evaluation

APPENDIX F (continued)

EXAMPLE LESSON PLAN (CONTROL)

Recorder Music Lesson Plan 1
4^{th} grade – Control Group

Conceptual Objective	Materials	Procedure	Evaluation
1. Pitch is highness or lowness of sound. 2. Tonal movement may progress by step, skip, or repetition. **Behavioral Objective** TSW play g^1 and e^1 on the recorder with 80% accuracy when playing *Cuckoo*. **Entry Level** **Melody:** high/low; high/low patterns; movement up, down, or repeat; movement by step, skip, repeat; wide/narrow range **Rhythm:** beat; tempo; meter; even/uneven division; duration may be same as beat, shorter, or longer **Harmony:** created by 2 or more sounds made simultaneously **Form:** motive; phrase; repetition/contrast (AB, ABA, Rondo) **Style:** patriotic, lullaby, folk, canon **Expression:** timbre; dynamics; accent groupings, melodic rhythm, movements of rhythmic patterns	1a. Lummi sticks 1b. *Cuckoo* from *TKM – 166* 1d-l. Timmons' notes [from AOSA conference] * 1d. Flanders Recorder Quartet: *Galliard*, *Courant* from *The Nations* CD 1ij. *Solfège* syllables 1ij. Curwen hand signs 1opq. White board 1opq. Overhead projector Transparencies: 1opq. *Cuckoo* written in *solfège* syllables (indicating high/low) 1opq. *Cuckoo* written with *e*, *g* (indicating high/low) 1opq. *Cuckoo* on 5-line staff with *e*, *g* 2. *Cuckoo* on 5-line staff, pitches notated with note heads	1a. *intro recorder poster, naming parts of instrument, brief history of recorder* 1b. Echo/speak *Cuckoo* in rhythm, echo/sing with *solfège* syllables and hand signs T1 1c. show/discuss visual with *solfège* notation; sing T3 1d. *C. mirror T., C. mirror partner T2 1e. *C. reverse-mirror T., reverse-mirror partner 1f. *Add lummi sticks – C. reverse-mirror partner T4 1g. *All reverse-mirror T. 1-hand, then 2-hands on stick, hands in correct recorder position (tap each hand on stick, then each finger) 1h. *introduce: warm-up position: warm recorder in left armpit (reduces condensation) ready position: chin supports in practice position blowing: experiment with amount, speed of air articulation: use "t" tongue to "speak" rhythm of *Cuckoo*, quieter each time until silent tonguing achieved embouchure: lips cover teeth, seal around mouthpiece 1i. *echo/play e^1; C. identify as *so* or *mi* T1 1j. *echo/play g^1; C. identify as *so* or *mi* T1 1k. *echo/play patterns of e^1, g^1 1l. *walk, blow single notes as long as possible (e^1, then g^1) 1m. *echo/sing: *solfège* leader sings neutral syllable, C. respond w/*solfège* leader sings note name, C. respond w/ same, fingering note leader sings neutral syllable, C. respond playing recorder T2 1n. echo/play *Cuckoo* 1o. show/discuss visual with *solfège* notation; play T3 1p. show/discuss visual with *e*, *g* with high/low; play T3 1q. show/discuss 5-line staff with *e*, *g*; play T4 2. show/discuss 5-line staff with note heads; identify with *so*, *mi*; sign/sing; play T5 discuss storage procedure *SUMMARY: Brief review of embouchure, hand positions, fingerings for e and g, positions on staff*	documented teacher observation **QCC** 1, 8, 10, 19, 21, 23 **NSME** 1, 2, 5, 6, 7 **Taxonomy** T1 Knowledge T2 Comprehension T3 Application T4 Analysis T5 Synthesis T6 Evaluation