

**A Comparison of Syllabic Methods
For Improving Rhythmic Literacy**

by

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ABSTRACT

This study investigated the effects of three syllabic recitation systems on improving abilities in reading rhythmic notation. Subjects were 160 second- and third-grade children enrolled in public schools in southern Maine. Twelve rhythmic patterns containing half, quarter, eighth, and sixteenth notes were used. Random combinations of the twelve patterns were combined into complete measures of 4/4 or 6/8. Subjects were tested on their abilities to recognize, write, and clap these patterns. Evaluation of these three skills was based on experimenter-designed tests, and a pretest-posttest experimental design was used. Results suggested that a syllabic system which differentiated between binary and ternary subdivisions of the beat improved recognition skills to a greater degree than one which did not. Furthermore, a system which assigned specific words to intact rhythmic patterns improved performance and notation skills to a greater degree than did the two systems which used monosyllables.

Abstract

Cette étude a examiné en détail les effets des systèmes de récitation de trois syllables sur l'amélioration des habiletés à lire la notation rythmique. Les sujets de cette expérience étaient 160 élèves du deuxième et du troisième niveaux inscrits aux écoles publiques dans le Maine méridional. L'auteur a employé douze modèles rythmiques dont chacun contenait des rondes, des blanches, des noires, des croches et des doubles croches. Des combinaisons de ces modèles ont été mises au hasard dans des mesures de 4/4 et de 6/8. Les sujets ont été évalués sur leurs habiletés de reconnaître ces combinaisons, de les écrire, et de les battre à la main. Cette évaluation, basée sur des épreuves créées par l'auteur, était donnée et avant et après l'expérience. Les résultats ont suggéré qu'un système différenciant entre les subdivisions binaires et tertiaires du battement a mieux développé la capacité de reconnaître ces combinaisons que les systèmes n'ayant pas cette distinction. De plus, un système assignant des mots spécifiques aux combinaisons rythmiques intactes a mieux développé les habiletés d'exécution et de notation que ceux employant des monosyllabes.

Table of Contents

	Page
I. Introduction	1-10
II. Method	11-20
III. Results	21-30
IV. Discussion	31-42
V. Appendices	
A. Appendix 1 - Recognition Test	43-46
B. Appendix 2 - Dictation Test	47-48
C. Appendix 3 - Performance Test	49-51
D. Appendix 4 - Student Data Sheet	52
E. Appendix 5 - Flash Cards	53-58
F. Appendix 6 - Student Worksheets	59-66
VI. References	67-69

If one accepts functional music literacy as a primary goal of the elementary school music curriculum, a choice of methodology for teaching musical notation becomes critical. When compared with the existing controversy over the relative merits of various tonal systems (Brown, 1974), methods of teaching rhythmic notation appear to be less clearly defined, and are less frequently subjected to empirical research.

Reichenthal categorized the four most popular methods of teaching rhythm as definition, action words, mnemonics, and number counting. Radocy and Boyle (1979, p. 96), in their analysis of methodology included performance techniques such as counting aloud, tapping the underlying beat, using the metronome, tapping or clapping the phrase rhythm, and conducting. There seems to be general agreement among music educators that mathematical-fractional definitions alone, which rely on children's comprehension of the terms "half, quarter, eighth, sixteenth," etc. are insufficient for conveying the durational relationships implied by the visual symbols (Brown, 1974; Choksy, 1979; Gordon, 1971, 1980; Hicks, 1980; Landis and Carder, 1972; Nash, 1974). Currently utilized alternatives to the traditional whole-note definition have employed kinesthetic activities and verbalizations. Gordon (1971) and Bebeau (1982) in fact claim that fractional definitions should be introduced only

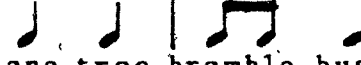
after students can perform simple rhythmic configurations using an alternative recitation system.

Methods of Teaching Rhythmic Notation

Two common approaches presently used to teach rhythmic notation are those used by practitioners of the Kodaly and Orff methods. In the Kodaly system, rhythmic reading begins with combinations of quarter notes and two eighth notes, recited on the syllables "Ta" and "Ti Ti", respectively. Elongations and subdivisions of these two basic configurations are then taught. Elongations are recited by extending the vowel sound of the quarter note syllable. Subdivisions of the quarter note pulse are assigned syllables according to the placement of the sixteenth note within each pattern. The Kodaly syllable system does not differentiate between binary and ternary subdivisions of the metrical pulse. For example,  and  both elicit the response "Tai - Ti Ti Ti". In order to place accent on the proper syllable, the student must understand and internalize the rhythmic stress implied by the meter. The syllables themselves do not provide a clue as to the placement of a metric accent.

The Orff approach differs from the Kodaly approach in that the basic "building block" patterns which consist of one, two, or three notes are learned by reciting a variety

of poems and proverbs. Meter, anacrusis, and accent are all introduced through rhythmic speaking. For example, the pattern  can be matched to the phrases "apple tree", "sycamore", "bramble bush" or "golden rod". It is assumed that the setting of each pattern to a variety of rhymes will result in learning patterns independently of any particular word or combination of words. Exercises in compound meter often employ the same words as exercises in simple meters:

6			
8	Pear tree apple tree,		Plane tree bramble bush
2			
4	Pear tree apple tree,		Plane tree bramble bush

Some music educators suggest pairing specific words to single notes or intact rhythmic patterns, so that the selected word or phrase has a durational value closely resembling the desired sound. In these systems, the chosen word or phrase serves as a mnemonic trigger for remembering the sound of a particular pattern. Choices of word "categories" include names of months and days (Cheyette, 1953) and names of English football teams (Gibbs, 1973). Cobb (1962) proposed the word "pie" for a quarter note, "apple" for two eighth notes, "gooseberry" for three eighth notes, and "huckleberry" for four sixteenth notes. Heffernan (1968) developed an "action word" system for simple meters whose words suggest some of the body movements used for note values in the Dalcroze method. A simplified "speech-cue" method which incorporates features

of Kodaly, Orff, and Heffernan was invented by Bebeau (1982). No one, however, has created a comprehensive onomatopoeic method in which a great variety of patterns are dealt with.

Unlike the Kodaly, Orff, Heffernan, or Bebeau methods, a number of syllabic recitation methods do provide the student with a consistent reference point for metric accent implied by the time signature. These methods differentiate between simple and compound meters by varying the syllables used for binary and ternary subdivisions of the beat. For example, the Gordon (1971) and Winslow-Dallin (1975) methods assign numbers to the accented meter beats within each measure. All other notes are chanted on syllables. Another approach suggested by Gordon (1980) used the syllable "du" for the meter beat within each measure. Figure 1 shows a tabular comparison of the above-mentioned methods.

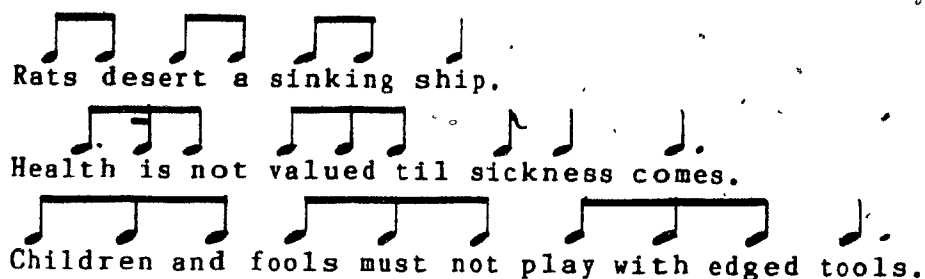
Related Research

There is little empirical research dealing with the efficacy of any of the above-mentioned methods. Palmer (1976) compared the effectiveness of the Kodaly syllables with Gordon's system in which numbers are used to identify meter beats. Both of the experimental groups of fourth-grade subjects scored significantly higher than did

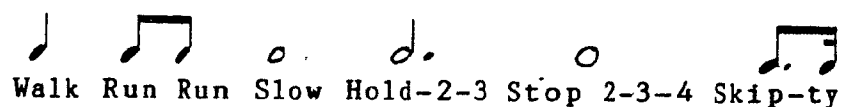
Kodaly



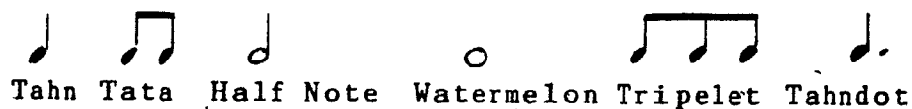
Orff

Cobb
Cheyette
Gibbs

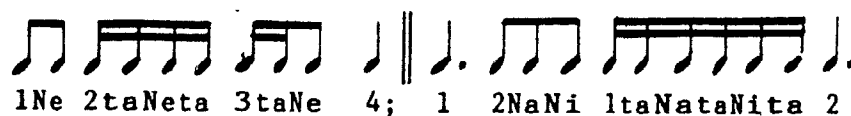
Heffernan



Bebeau



Gordon(1971)



Winslow-Dallin 1 & 2 e & a 3 e & 4; 1 2LaLi 1 eLa eLi e 2

Gordon (1980) DuDeDutaDetaDutaDe Du; Du DuDaDiDutaDataDitaDu

Figure 1 - Methods of Teaching Rhythmic Notation

the control group on standardized achievements tests and experimenter-designed performance measures. In addition, the comparison of Kodaly and Gordon in terms of performance achievement gain scores revealed that the Gordon approach produced greater gain than did the Kodaly approach ($p < .03$). Siemens compared the Orff approach to a traditional method. Subjects were 458 fifth-grade students. She found that the Orff approach generated more student interest than did the traditional approach ($p < .001$). However, students receiving traditional instruction scored higher on standardized achievement tests ($p < .05$). Unfortunately, a control group was not included in the study, and students were not pretested prior to treatment.

Recently, Bebeau (1982) compared a simplified speech-cue method to a traditional mathematical explanation approach for teaching rhythmic notation to third-graders. Students clapped various 4/4 combinations of the symbols which ranged in length from one to ten measures. Only the students in the mathematical explanation group were required to maintain a steady observable pulse response while clapping the examples. Bebeau's decision to include this feature was based on research findings by Boyle (1970), who found that foot tapping significantly improved the rhythmic reading ability of high school band students. Students in both the traditional and speech-cue groups made significant gains in rhythmic reading accuracy from pretest to posttest, but neither was compared to a control group.

Research by Palmer, Seimens, and Bebeau suggests that alternative methods might be just as effective as a traditional mathematical approach. However, no research to date has compared alternative methods to one another. The present study was designed to determine the relative effectiveness of three recitation systems on improving the rhythmic reading ability of elementary school children. Recent research suggests that rhythmic reading ability is dependent on a number of apparently independent cognitive and motoric skills. The ability to determine whether two patterns are the same or different does not indicate an ability to perform them accurately (Van Zee, 1976). Recognition of a pattern's notation is unrelated to the ability to write the notation of the same pattern (Gordon, 1980). Further differences in aural perception abilities arise when melodic variations are imposed upon the same rhythmic figures (Zimmerman and Sechrest, 1968).

In the present experiment, three skills were chosen for evaluation: (1) the ability to recognize the notation of a complete measure of either 4/4 or 6/8 upon hearing it, (2) the ability to write the notation of the measure by adding the proper stems and beams to a given number of note heads, and (3) the ability to clap the entire measure correctly without the aid of a given pulse. No attempt was made to determine if these three skills were intercorrelated. Instead, data were analyzed to determine

if any of the methods were more or less effective than the others on improving each of the skills.

The Kodaly method, the Gordon (1980) method, and the word method were selected because each could be presented in an intact-pattern format without the aid of mathematical explanations. Subjects were taught to read combinations of notes as units rather than individual notes in relation to one another. Rhythmic reading was limited to six binary and six ternary rhythmic patterns. The author hoped to find out whether or not differences in recitation syllables would have any effect on improving rhythmic reading skills.

Of the three methods chosen, the Kodaly system is the only one which does not differentiate between binary and ternary subdivisions of the beat by a change of syllable, consonant, vowel, or word. For purposes of this experiment, it was necessary to isolate and extract the rhythmic component of the Kodaly curriculum. Rhythmic notation was not taught in strict accordance with the Kodaly philosophy; the recommended sequence of rhythmic patterns was altered, and no attempt was made to teach children many rote songs containing rhythmic figures whose notation they were about to learn.

The Gordon (1980) system differs from the Kodaly system in that its thrust is primarily metrical. Each pattern begins with the syllable "Du", regardless of the value of the note on which the metrical stress occurs. Thus, the student is given a sense of metrical accent by realizing that all "Du's" are equidistant from one another. In addition, Gordon provides for binary and ternary subdivisions by changing the vowels following the initial "d" or "t" consonant on the second or third subdivision of each beat. Binary subdivisions of the quarter and eighth note in compound meter are consistent with binary subdivisions in simple meters.

The mnemonic word approach incorporates features of both the Kodaly and Gordon methods. Each pattern is represented by a specific word or phrase whose pronunciation allows for proper placement of the metric accent. Differences between simple and compound meters, as well as binary and ternary subdivisions, are accommodated by using a different word or set of words for each intact pattern. Words are chosen whose "natural" pronunciation closely resembles the desired sound of each pattern. When encountering each pattern, the child must remember a specific word or phrase for the pattern's sound, rather than recall the correct order and combination of monosyllables. The word method provides both a consistent metrical pulse and a differentiation between duple and

triple subdivisions of the beat. The consistent pulse is inherent in the pronunciation of the twelve chosen words or phrases, each having its accent on the first syllable. Binary and ternary subdivisions are accommodated by using different "sets" of words for each.

METHOD

Subjects

Subjects were 160 second- and third-grade children enrolled in public schools in southern Maine. Schools were chosen from two neighboring towns with similar socio-economic backgrounds. Due to limited enrollments in the available schools, it was necessary to use 120 subjects in the Wells Elementary School for the three experimental groups, and 40 subjects from the Lincoln Elementary School in Sanford as the control group. Three second- and three third-grade classes were randomly assigned to receive one of the three methods of instruction. One second- and one third-grade class was assigned to each experimental group. The second- and third-grade classes at the Lincoln Elementary School received no instruction in rhythmic notation during the course of the experiment.

Equipment

Testing equipment consisted of a pre-recorded cassette tape of the test instructions and musical examples, and a cassette tape recorder. All test examples were played on a bongo drum.

Equipment used in the treatment sessions consisted of 30 pairs of rhythm sticks, 94 7.5cm x 35cm flash cards, a guitar, a bongo drum, and 30 popsicle stick kits. The kits each contained 20 popsicle sticks, 10 popsicle stick halves, six dried white navy beans, and five 2cm

metal-rimmed key tags with paper centers. In addition, the experimenter used recordings of Leroy Anderson's "Syncopated Clock" (RCA LM/LSC 2638) and Mozart's German Dance, K. 605, #3 "Sleigh Ride" (MHS 4289).

Procedure

The experiment was conducted during eleven weeks of the subjects' weekly general music classes. All testing and instruction was done by the experimenter. Pretests were administered to all eight classes during the second and third weeks of October, 1982. Posttests were administered during the second and third weeks of February, 1983. The scores of 20 students from each class were randomly chosen for statistical analysis.

Pre-and posttests

Recognition and dictation tests were given to each entire class simultaneously. The performance tests were given to each child individually. For each of the three measures, the pretest and posttest were exactly the same.

Recognition Test. The recognition test (Appendix 1) consisted of 20 multiple choice items in which subjects were required to choose the notation for the example they heard from three notated examples. This test was designed to measure subjects' understanding of beams, flags, and note heads. The three choices in each test item had the same number of note heads to prevent children from simply

"counting the dots" to match the "number of taps" on the drum. Note heads were equidistantly spaced on the page to insure that children were recognizing each symbol according to its actual durational meaning, rather than to its proportional placement within each box. Ten of the test items were complete measures of 4/4, and 10 items were complete measures of 6/8. To construct each 4/4 measure, the six binary patterns included in the experiment were written once each on four separate pieces of paper, folded, and put into four piles. One "beat" of each measure was randomly chosen from each of the four piles to form a complete measure. The pieces of paper were then returned to the piles, and the process was repeated until 10 complete 4/4 measures had been formed. The process was then repeated with the six ternary patterns to form 10 complete 6/8 measures. The order of the 20 completed test items was determined randomly. The two incorrect measures on each test item were comprised of the 12 patterns which were to be taught during the course of the experiment.

Test directions and musical examples were prerecorded on a cassette tape. Each test item was played three times on a bongo drum (m.m. ♩ = 60). A five-second silence followed both the first and second playing, and a ten-second silence followed the third playing. Subjects were required to write the letter of their choice in the corresponding blank on their answer sheet. In order to avoid confusion between the numbered rows and the lettered

columns on the test sheet, the experimenter asked the children to place a ruler directly under the appropriate test item and to move the ruler down the page as the test progressed. After the test papers and answer sheets had been collected, students were given the rhythmic dictation test.

Dictation test. The dictation test (Appendix 2) measured subjects' ability to notate a complete measure of either 4/4 or 6/8 by adding stems and beams to a given number of note heads. The same twenty measures that had been used in the recognition test were used for the dictation test. Test directions and musical examples were prerecorded on a cassette tape. Each test item was played three times on a bongo drum (m.m.  = 60). A five-second silence followed both the first and second playings. Thirty seconds elapsed after the third playing so that the children would have enough time to complete their answers. Many of the children expressed frustration with the dictation pretest because they did not understand the meaning of the terms "stem" and "beam". They were told to do their best, and to leave an item blank if they did not understand it.

Performance test. The performance test (Appendix 3) measured the subject's ability to accurately clap a complete measure of 4/4 or 6/8. Each of the twenty

measures used in the recognition and dictation test was printed on a 7.5cm x 35cm flash card with note heads equidistantly spaced. A testing station was set up in a secluded corner of a school hallway. The station consisted of a student desk, a chair on either side of the desk, and a partition which provided privacy from the rest of the hallway. The subject sat across from the experimenter. Immediately after the student clapped a response to each card, the experimenter recorded this response as correct or incorrect on the performance score sheet. The stack of flash cards was held directly in front of the score sheet so that the subject received no feedback concerning whether his or her response was correct. Total testing time for the performance tests varied from subject to subject, depending upon the tempo at which the subject clapped each card. The total time required for each subject to perform the 20 flash cards ranged approximately from one minute to three and one half minutes.

Pretest scoring. On all three pretests, one point was awarded for each correct response, making the highest possible score on each test 20 points. No partial credit was given on either the dictation test or the performance test. In order for a notated test item to be scored as correct, the entire measure had to be notated correctly. In order for a performed item to be scored as correct, the entire measure had to be performed at the same tempo, and

the notes had to be in correct proportion to each other. When all pretesting was completed, scores from the three tests were recorded on the student data sheet (Appendix 4).

Treatments

Treatment sessions for each group were identical except for the recitation system used (See Figure 2). Nine lessons were taught to each of the six classes. Patterns to be taught were presented in the order shown in Figure 2.

The terms "note head", "stem", and "beam" were introduced in Lesson 1. Two duple patterns were introduced each week in Lessons 1, 2, and 3. Lesson 4 was devoted to a review of the six duple patterns. Two new triple patterns were introduced each week in Lessons 5, 6, and 7. Lesson 8 was devoted to a review of the six triple patterns, and to a discussion of the difference between "duple" and "triple" patterns. In Lesson 9, all twelve patterns were reviewed. Each lesson was 35 minutes in length. Five minutes were devoted to review and/or introduction of new material. The remaining time was divided equally for practicing recognition, dictation, and performance skills.

Initial practice in rhythmic performance consisted of numerous rote echo exercises, each comprising a complete measure performed at approximately ♩ = 60 m.m. or ♩. = 60 m.m., depending on whether the exercise was in duple or triple time. The echo exercises were often accompanied by

Duple Patterns

						
Kodaly	Ta	TiTi	TiRiTiri	Ta-ah	TiTiRi	TiRiT
Gordon	Du	DuDe	DutaDeta	Du-u	DuDeta	DutaDe
Word	Maine Kansas Mississippi Ma-ine No-body Anyone					

Triple Patterns

						
Kodaly	Tai	TiTiTi	Ta Ti	TiriTiriTiri	Tiri TiTi	Ti TiriTi
Gordon	Du	DuDaDi	Du Di	DutaDataDita	Duta DaDi	Du DataDi
Word	Wells Washington Boston Knickerbockermaker Very Easy Not Difficult					

Figure 2 - Treatments Used with Experimental Groups

kinesthetic movements such as clapping, stamping, snapping fingers, etc. Children were then asked to perform rhythms from flash cards containing combinations of previously learned patterns and new patterns (Appendix 5). Opportunities were given for both group and solo performance. The performance readings were often accompanied by recordings or ostinato chord progressions played by the experimenter on a guitar.

Dictation practice consisted of three basic exercises. Using the popsicle stick kits, students were first asked to notate rhythms by constructing the configurations of stems, beams, and heads on certain flash cards from the day's lesson. The key tags were used for half note heads and the beans were used for dotted notes. Quarter notes, eighth notes, and sixteenth notes were constructed with stems only. Second, the experimenter played three or four examples on a bongo drum for the children to notate with popsicle sticks. The experimenter chanted the accompanying syllables or words while playing the patterns on the drum. Finally, the class was given a written rhythmic dictation worksheet (Appendix 6).

Recognition practice consisted of a recognition game and the use of a recognition worksheet (Appendix 6). In the recognition game, three students were chosen to stand in front of the class holding one flash card each. From behind the group, the experimenter clapped and chanted one of the cards. The class was asked to guess which of the

three cards had been clapped. Three new students were chosen, and the process was repeated seven or eight times. The entire class was then given the recognition worksheets. Recognition worksheets required children to choose the notation of performed rhythms from among three choices.

Treatments

Treatments differed only according to the syllabic system with which the subjects were taught to remember the sound of each pattern. The Kodaly subjects learned each patterns as a different combination of monosyllables, each beginning with the letter "t". The vowels and consonants following the initial "t" varied, according to whether or not the patterns contained quarter notes, eighth notes, or sixteenth notes. The Kodaly syllables remained constant for half notes, quarter notes, eighth notes, and sixteenth notes, regardless of changes in meter, subdivisions of the beat, or placement of the notes within the pattern.

The Gordon subjects learned to begin each pattern with the syllable "Du", regardless of the value of the initial note. The syllables used for the remaining notes in each pattern varied according to whether the pattern was used in duple or triple meter. In addition, the vowel sounds of the syllables changed depending on whether the subdivision of the beat was binary or ternary.

Subjects in the word group learned to match specific words or phrases to each of the twelve rhythmic patterns.

A different word or phrase was used for each pattern, with the exception of the word "Maine", which was used for both the quarter note and the half note.

None of the subjects were taught the terms "quarter, eighth, sixteenth," etc. Mathematical explanations such as "half as fast" or "twice as long" were not used. Instead, note patterns were referred to by their syllable or word names. For instance, when the pattern containing four sixteenth notes was introduced, subjects in the Kodaly group learned to chant it and refer to it as a "TiriTiri". Subjects in the Gordon group were taught that it was a "DutaDeta", and subjects in the Mnemonic Word group referred to it as a "Mississippi".

RESULTS

Analysis of Pretest Scores

Recognition scores.

Mean pretest recognition scores were calculated for the four groups (Table 1). The data indicated that the groups might have been unequal prior to treatment. It was therefore necessary to determine if the difference between groups was significant. A one-way analysis of variance was performed on the recognition pretest data to test for equality between groups.

Table 1
Recognition Pretest Scores

	n	Mean	SD
	160	8.02	2.55
Control	40	7.47	2.48
Word	40	9.05	2.30
Gordon	40	8.15	2.57
Kodaly	40	7.40	2.58

Results from the analysis of variance (Table 2) showed a significant difference between groups in terms of their pre-treatment recognition skills ($p < .012$). Since it was impossible to regroup the students for purposes of this experiment, it was necessary to compensate for pre-treatment differences statistically in the analyses of posttest data.

Table 2

Analysis of Variance Summary Table for Recognition Pretest

Source	SS	DF	MS	F	p
Treatments	70.369	3	23.456	3.802	.012
Error	962.560	156	6.170		
Total	1032.929	159	6.496		

Dictation scores.

Table 3 shows the results of the dictation pretests for the four groups. The mean scores indicate that the dictation test was rather difficult for all four groups of subjects, considering that the highest possible score was 20. The Gordon group, however, seemed to have an advantage over the control group and the Kodaly group. A one-way analysis of variance was performed on the dictation pretest data to test for equality between groups.

Table 3

Dictation Pretest Scores

	n	Mean	SD
	160	.3	.73
Control	40	.1	.38
Word	40	.4	.92
Gordon	40	.5	.78
Kodaly	40	.2	.69

Results from the analysis of variance on the dictation pretest scores are shown in Table 4. Because the difference between the groups approached significance ($p < .058$), the four groups were considered to be unequal prior to treatment for the analysis of dictation posttest data.

Table 4

Analysis of Variance Summary Table for Dictation Pretest

Source	SS	DF	MS	F	p
Treatments	4.000	3	1.333	2.549	.058
Error	81.599	156	.523		
Total	85.599	159	.538		

Performance scores.

Table 5 shows the mean scores of the four groups on the performance pretests. The Word group mean score indicated that this group may have had a possible pre-treatment advantage over the other three groups. A one-way analysis of variance was performed on the performance pre-test data to determine the significance of the difference between the mean pretest scores.

Table 5
Performance Pretest Scores

	n	Mean	SD
	160	.5	1.07
Control	40	.27	1.01
Word	40	.75	1.25
Gordon	40	.40	1.00
Kodaly	40	.57	.98

Results from the analysis of variance on performance pretests are shown in Table 6. These results indicate that the pretreatment difference between groups in terms of performance skills was non-significant ($p < .217$).

Table 6

Analysis of Variance Summary Table For Performance Pretest

Source	SS	DF	MS	F	p
Treatments	5.150	3	1.717	1.497	.217
Error	178.849	156	1.146		
Total	183.999	159	1.157		

Analysis of Gain Scores

Since the analyses of variance on the recognition and dictation pretest data indicated that the groups were not equal in these two skills prior to treatment, it was necessary to compensate for these differences in the analyses of posttest and gain score data. For both the recognition and dictation measures, the posttest scores were evaluated using the pretest score as a covariate of the posttest score. For the performance measure, a one-way

analysis of variance was performed on the gain scores of the four groups.

Gain scores were calculated for each subject by subtracting the pretest score from the posttest score. Mean gain scores for the four groups were then derived. Table 7 shows the mean gain score of each group for recognition, dictation, and performance.

Table 7
Gain Scores

	n	Mean	SD
Recognition	160	2.76	3.7
Control	40	.9	3.31
Word	40	4.10	3.62
Gordon	40	4.12	3.43
Kodaly	40	1.92	3.47
Dictation	160	1.27	2.10
Control	40	.20	.46
Word	40	2.70	2.52
Gordon	40	1.55	2.37
Kodaly	40	.62	1.42
Performance	160	3.03	4.85
Control	40	-.02	.16
Word	40	8.55	6.08
Gordon	40	2.10	2.42
Kodaly	40	1.50	3.02

The analysis of covariance on the recognition posttests revealed a significant difference between groups at the .0001 level (Table 8). A Newman-Keuls test was then applied to the mean gain scores to determine which of the methods were more effective than the others.

Table 8

Analysis of Variance

Post-Recognition with Pre-Recognition as Co-Variate

Source	SS	DF	MS	F	p
Co-Variate	321.9	1	321.918	32.9	.0001
Main Effects	460.367	3	153.456	15.7	.0001

The Newman-Keuls procedure revealed no significant difference between the Word and Gordon methods for improving recognition skills. Both the Word and Gordon method were significantly more effective than the Kodaly method. The Kodaly subjects, however, did not make significant gains in recognition ability when compared to the subjects who received no instruction. Results from the Newman-Keuls procedure are shown in Table 9. The underlined scores in Tables 9, 11, and 13 indicate non-significant differences between groups. All other comparisons are significant.

Table 9

Newman-Keuls Procedure-Recognition

Control	Kodaly	Gordon	Word
.90	1.92	4.12	4.10

The analysis of covariance on the dictation measure revealed a significant difference between groups at the .0001 level (Table 10). A Newman-Keuls procedure was applied to the dictation gain scores to determine the relative differences between the four methods.

Table 10

Analysis of Variance

Post-Dictation with Pre-Dictation as Co-Variate

Source	SS	DF	MS	F	p
Co-variate	6.019	1	6.019	1.97	.162
Main Effects	183.551	3	61.184	20.022	.0001

Results from the Newman-Keuls procedure on the dictation task are shown in Table 11. A significant difference existed between the Word and Gordon methods for this task, with the Word method proving superior. The gains made by the Gordon subjects were significantly

greater than those of the Kodaly subjects. There was no significant difference between the gain made by the Kodaly subjects and that of the control group.

Table 11

Newman-Keuls Procedure-Dictation

Control	Kodaly	Gordon	Word
.2	.625	1.55	2.7

Table 12 shows the results of a one-way analysis of variance applied to the performance gain scores. The difference between groups was significant at the .001 level.

Table 12

Analysis of Variance Summary Table for Performance Gain

Source	SS	DF	MS	F	p
Treatments	1720.369	3	573.457	44.145	.001
Error	2026.462	156	12.99		
Total	3746.831	159	23.565		

The results from the Newman-Keuls procedure on the performance scores are shown in Table 13. The gains made in performance ability by the Word subjects were

significantly greater than all other groups. The gains made by the Gordon subjects were significantly greater than those made by the control group. It appears, however, that the difference between the Gordon and Kodaly subjects was marginal.

Table 13

Newman Keuls Procedure - Performance

Control	Kodaly	Gordon	Word
-.25	1.5	2.1	8.55

Summary

Results from this study can be summarized as follows:

1. On the recognition task, the difference between the improvement of the Word subjects and that of the Gordon subjects was non-significant. The performance gain of both of these groups, however, was significantly greater than either the Kodaly group or the control group.

2. The improvement of the Kodaly subjects in the recognition task was not significantly greater than their counterparts in the control group.

3. On the dictation measure, the achievement gain of the Word group was significantly greater than all of the other groups. The improvement of the Gordon group was significantly greater than that of the Kodaly group and the control group.

4. The dictation gain of the Kodaly subjects was not significantly greater than that of the subjects in the control group.

5. In terms of performance ability, the gain of the Word group was significantly greater than that of the other three groups. The performance gain of the Gordon subjects was significantly greater than that of the control subjects.

6. The performance improvement of the Gordon group was only marginally greater than that of the Kodaly group, and the performance gain of the Kodaly group was only marginally greater than that of the control group.

Discussion

Experimental Methodology

The results of this study seem to indicate that teaching methods played a significant role in affecting the subjects post-treatment rhythmic reading abilities. As in many methodology studies conducted in the public schools, it is possible that the differences between the gain scores of the four groups may have been influenced by variables other than treatment.

Differences in rates of learning may have been an influential factor in the achievement gain made by each of the three experimental groups. The Word group had above-average mean scores on all three experimental pretests. The Kodaly group had below-average scores on the recognition and dictation pretests, and an average score on the performance pretest. Although the significant pre-treatment difference between groups was accounted for by using an ANCOVA, one cannot rule out the possibility that the children in the Word groups either had more pre-treatment ability, or learned at a faster rate than their counterparts in the other three groups. It is possible that the Kodaly subjects were simply slower learners, and that given more time, their progress might have equaled that of the other two groups.

Student motivation may have been a second reason for the differences in the achievement gains of the four groups. The author noticed that the enthusiasm demonstrated by the experimental classes varied a great deal between the six groups as the experiment progressed. The attention span of students in both of the Kodaly classes seemed to diminish considerably by the third and fourth weeks of instruction. They often expressed boredom with the tasks at hand, and became confused and frustrated as more patterns were added to their repertoire.

The enthusiasm of the Gordon subjects began to wane in Lessons six and seven. Fewer students volunteered answers to questions than in the earlier lessons. Although their attention span continued longer than the Kodaly subjects, they too became frustrated and bored as more syllables were added, and the combinations of rhythmic patterns became more complex.

The majority of subjects in the Word groups, however, remained interested and enthusiastic throughout the course of the experiment. They seemed to accept each new pattern as a challenge, and seldom expressed dislike for the day's activities. They were eager to give their answers to the experimenter, and seemed to enjoy chanting and performing various combinations of rhythmic patterns, regardless of the pattern's complexity. They seldom experienced difficulty in remembering the corresponding word for each pattern.

It is possible that the difference between the syllabic methods accounted for the level of student interest, and consequently the relative level of achievement gain. It would have been beneficial to have compared the relationship between student motivation and achievement gains. Motivational factors which were more accurately measured by a post-treatment student interest survey might have supported the notion that the students in any particular group enjoyed their learning experiences more than the others, and consequently improved their skills to a greater degree.

The "experimenter-as-teacher" design of this study may have also influenced the results of this experiment. The experimenter was the regular music teacher for all six experimental classes, and had known the children for two years. The students in the Wells school may have had the advantage of familiarity with the experimenter and thus may have felt more at ease during testing than did the control group.

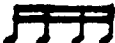
Limitations of the design of this study notwithstanding, there appear to be some fundamental differences between the effectiveness of the three chosen methods. It is the author's contention that the syllables themselves accounted for the level of effectiveness of each method.

Group Differences

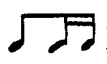
On the performance pretest, the majority of subjects seemed to attend to the number of note heads on each card, clapping once for each note with no apparent metrical stress. On the performance posttest, many children in the Kodaly groups continued to use this strategy, randomly assigning "Ti's" and "Ta's" as they clapped isolated sounds. The only exception to this strategy was that the Kodaly subjects generally clapped the sixteenth note patterns faster than the other notes, and remembered that the sixteenth note syllables were "TiRiTiri". An examination of the Kodaly syllable system may explain the Kodaly subjects' behavior.

The entire sequence of Kodaly syllables is constructed from four basic mono-syllables: "Ta", "Ti", "Ri", and "Tai". As long as rhythmic reading was confined to the first four patterns studied (♩, ♪, ♫, ♮), the children were able to differentiate between the sounds of the patterns, and to recognize, write, and perform them accurately. "Ta", "TiTi", "TiriTiri", and "Ta-ah" are four distinct units, each quite different from the other. As more patterns were added, however, the children had difficulty remembering the proper order and combination of syllables, and their performance on all tasks deteriorated. Much confusion resulted in teaching the children to distinguish between "Ta", "Ta-ah", and "Tai", particularly in dictation exercises for which the children had to

distinguish between 4/4 and 6/8. The similarity between these syllables appeared to be the greatest cause for confusion. The fact that the Kodaly children remembered "TiRi" more often than the other syllables might be because it is the only syllable combination which remained an unchanged intact unit for all patterns which contain sixteenth notes.

In comparison, "TiTi" was presented in Lesson One as an intact unit for a two-note pattern (). In the second lesson "Ti" was assigned to a single sixteenth note, but joined to "Ri" to become "TiRi" (). In the third lesson "Ti" was assigned to both a single eighth note and a single sixteenth note ( , ). In the fourth lesson "Ti" was used for each of three separate eighth notes which were joined by a ligature. In the fifth lesson, "Ti" was assigned to an eighth note with a flag. It is therefore possible that the Kodaly students' confusion resulted from the use of the same syllable for a variety of visual configurations. Curiously, however, they did not ever separate the syllable "Ti" from "Ri" when these two syllables were combined for sixteenth note patterns. They consistently seemed to conceptualize "TiRi" as an intact unit.

Defining a metric stress was a noticeable problem for the Kodaly groups. Even though the experimenter always read the patterns with an accent on the first note of the pattern, the students tended to continue to associate a

single syllable with a single note, granting all notes equal stress, with the exception of sixteenth notes. They would pause, for example, between an eighth note and the two sixteenths following it (). It was common for students to stop in the middle of a pattern and correct themselves, changing a "Ta" to a "Ti" or a "Ti" to a "Tai". They did not conceptualize that each pattern was a unit, connected to another unit by a continuing steady pulse. Instead of perceiving the combinations of notes as intact patterns, they seemed to see "Ta"'s, "Ti"'s, and "Tiri"'s as separate units in and of themselves.

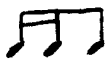
The strength of the Gordon method seemed to be in the area of metric accent. Subjects in the Gordon groups generally clapped the posttest examples with a consistent metrical stress, even though the division within each beat may have been incorrect. They tended to conceptualize each flash card as one measure having either two or four accented pulses within it. In addition, the Gordon subjects were better able to conceptualize the difference between simple and compound meters, as evidenced by their dictation gain in comparison to the Kodaly subjects' dictation gain.

The logical structuring of the Gordon syllables in terms of metrical pulse and consistent subdivisions was evidently a factor in improving rhythmic reading skills of the Gordon treatment groups. The consistent syllable "Du" on the first note of each pattern gave children a reference point for metrical stress which was evident in the

performance posttests. The differentiation in vowel sounds between binary and ternary subdivisions of the pulse helped children to hear the difference between 4/4 and 6/8, as evidenced by their dictation gain in comparison to the Kodaly and control groups. The Gordon method failed, however, when children had to recall the appropriate combinations of syllables for specific patterns. Recollection of syllable names was required for both the performance and dictation tasks, but not for the recognition task. The Newman-Keuls procedure showed that the Gordon method was not as effective as the Word method for improving performance or dictation skills, but no less effective than the Word method for improving recognition skills.

The mnemonic word method proved to be more effective than either the Kodaly or Gordon methods for improving dictation skills, and overwhelmingly more effective than the other methods for improving performance skills. It is the author's conclusion that the success of the Word subjects was due to the structure of the Word method itself. Of the three methods examined, the Word method appears to be the most appropriate for an intact-pattern approach to rhythmic reading. Subjects in the word group conceptualized the patterns as intact units because the words themselves are intact units, regardless of their rhythmic connotation. For example, it would have seemed "unnatural" to the children to pause between the syllables

of the word "Washington" as the Kodaly or Gordon subjects did between "TiTiTi" or "DuDaDi". In addition, the accented first syllable of all the words or phrases gave children a sense of a continuing metric accent. Each measure could be read like a sentence of sorts, which, like any sentence, has a rhythmic flow from one word to the next.

A noticeable weakness of the Word method was the choice of words whose pronunciation had the same rhythmic sound. For example, a common mistake for the Word subjects was to use "Nobody" instead of "Anyone" for , because the word could match either rhythm, depending on how the child pronounced it. However, the distinction between binary and ternary "sets" of words was apparently clear to the children. The Word subjects never used "Nobody" or "Anyone" in place of "Washington" for , even though all three words have three syllables. It was the similarity of two words within the binary set which seemed to cause confusion. The children might also have confused the two words because of their somewhat related meaning.

In summary, there were three noteworthy factors which led to the relative effectiveness of the three syllabic recitation systems examined in this study. The first was the ease with which children could recall the syllables for a specific pattern. This study showed that it is easier for children to recall words and phrases as intact units

than it is for them to remember combinations of nonsense syllables. Another important factor in the methods' effectiveness was the existence of a reference point for metrical stress, as evidenced in this study by the lack of a defined metrical pulse in the Kodaly subjects performance, and the presence of such in the Gordon and Word subjects' performance. The Gordon method utilized the consistent syllable "Du" for this purpose. The word method provided metrical accent by employing words or phrases whose accent is on the initial syllable. The Kodaly method provided no reference point for metric stress. The third feature which contributed to the methods' effectiveness was a differentiation between binary and ternary subdivisions of the beat. The Kodaly method made no provision for distinguishing between binary and ternary patterns. The Gordon method changed the vowel sound following the initial consonant for this purpose, and the Word method incorporated this feature by using different sets of words for different meters.

Future Research

The complexity of rhythmic patterns which can be taught by using syllabic recitation systems remains a pedagogical problem which warrants further investigation. Certainly, reading one-measure examples containing the twelve rhythmic patterns employed in this study does not constitute rhythmic literacy. Before any syllabic method

could be fully adopted as a viable teaching tool, issues of meter, anacrusis, syncopation, tied notes, rests, etc., would need to be addressed. The success, albeit limited, of the alternatives to the whole-note definition approach as examined in this study pose several questions which might be of interest to future researchers:

1. Would an alternative recitation system used in conjunction with mathematical explanations be more effective than using the recitation system by itself?
2. If rhythmic reading were to be postponed until children have mastered fractional equivalencies, would children who began to read rhythms with words or syllables be any further behind or ahead of those who did not?
3. What level of difficulty could we expect children of various ages to reach before it became necessary to explain time signatures and the proportional relationships between notes and rests in terms of fractions?
4. If a syllabic system were used, how and when would rests be taught? Would rests each have an assigned syllable or sound (e.g. the Kodaly practice of saying "Sh" for a quarter rest), or would they be presented as silences equal to the duration of a particular intact pattern?
5. Could a word method such as the one used in this study be developed into a taxonomy of rhythmic

patterns for teaching purposes? If so, how might regional dialects affect the pronunciation of certain words and phrases? What are the implications of using the word method in foreign countries? Would the order in which the patterns were presented vary according to the meter of the native tongue of the students?

Perhaps the information gained from this study will lead to further investigations of the potential usefulness of intact words for the teaching of rhythmic notation. Future experimenters might attempt to train musicians to notate numerous words or phrases according to their most "natural" pronunciation. This might determine the existence of precise notational equivalents for certain words. If such equivalents existed, it would then be possible to create a taxonomy of "rhythmic words" for teaching purposes.

Walker (1981) has proposed that many children possess an internalized cross-modal matching system in which untrained children are able to match an aurally presented musical example to a picture depicting its musical structure. It would be interesting to know whether a similar cross-modal matching system exists for language and rhythmic notation as well. Researchers might ask children to choose from three or four notations the one that best matches a certain word or phrase. If children were found to consistently choose the same notations, it would seem

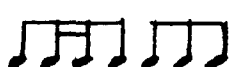
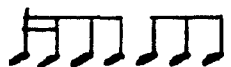
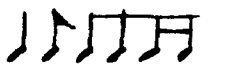
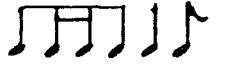
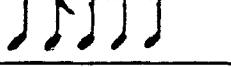
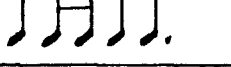
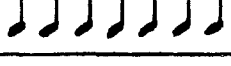
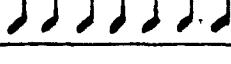
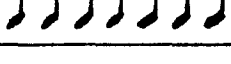
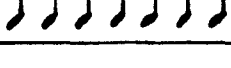
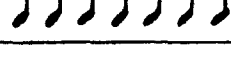
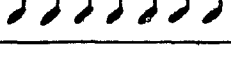
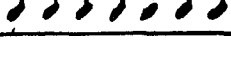
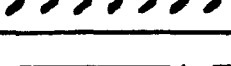
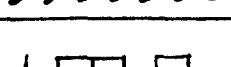
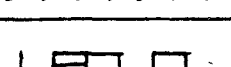
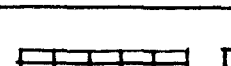
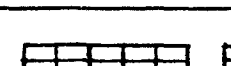
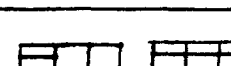
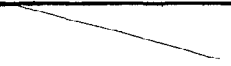
that those words would be suitable for inclusion in a rhythmic reading curriculum.

It would serve the interests of elementary music educators for researchers to develop a hierarchy of rhythmic patterns in terms of their relative difficulty. This type of research should then be compared with studies which examine children's motoric and cognitive development in terms of rhythmic notation. Elementary music teachers might then develop a prescribed curriculum for teaching rhythmic notation which is compatible with their students' abilities. At present, many rhythmic notation curricula are based on the notion that children will most readily read that which they can perform by rote. Common practice is to begin with the quarter note, two eighth notes, half note, and quarter rest in simple meters. Beyond this stage, teaching practices appear to be quite divergent. The fact remains that few, if any, of these curricula are based on empirical evidence that such teaching strategies are effective in terms of improving rhythmic literacy. It is hoped that researchers will join efforts with elementary music teachers in continuing methodology research similar to the type presented in this paper. It is in the best interests of our students to develop teaching methods which are practical, motivating, and most importantly, effective.

APPENDIX 1

Rhythmic Recognition Test Directions

In the following test, you will hear 20 rhythmic examples. Each example will be played three times on a drum. On your test paper, you see the numbers one through twenty along side the left margin. Next to each number are three boxes, lettered A, B, and C. You are to decide which of the boxes matches the rhythm of the example you are hearing! When you have decided, place the letter of that box next to the number on the answer sheet. Be sure that you only choose ONE letter for each number. Are there any questions?

1. A) 	B) 	C) 
2. A) 	B) 	C) 
3. A) 	B) 	C) 
4. A) 	B) 	C) 
5. A) 	B) 	C) 
6. A) 	B) 	C) 
7. A) 	B) 	C) 
8. A) 	B) 	C) 
9. A) 	B) 	C) 
10. A) 	B) 	C) 
11. A) 	B) 	C) 
12. A) 	B) 	C) 

APPENDIX 1

Rhythmic Recognition Answer Sheet

(Correction Key)

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

1. A
2. C
3. B
4. C
5. B
6. A
7. B
8. B
9. B
10. A
11. C
12. A
13. A
14. C
15. C
16. C
17. A
18. B
19. B
20. A

NAME

TEACHER

APPENDIX 2

Rhythmic Dictation Test Directions

In the following test, you will hear 20 rhythmic examples. The rhythm of each example will be played three times on a drum. You are to complete the rhythm of each example by adding stems and beams to the note heads on your answer sheet.

APPENDIX 2

Rhythmic Dictation Answer Sheet

- | | |
|-------------------------|---------------------------|
| 1) / / / / / / / | 11) O / / / / / / / |
| 2) / / / / / / / | 12) / / / / / / / / / / |
| 3) / / / / / / / / / / | 13) / / / / / / / / / |
| 4) / / / / / | 14) / / / / / / / / / |
| 5) O / / / / / / / | 15) / / / / / / / / |
| 6) / / / / / / / / | 16) / / / / / / / / / / |
| 7) / / / / / / / / / | 17) / / / / / / / / / / / |
| 8) / / / / / / / / / | 18) / / / / / / / / |
| 9) / / / / / / / / / / | 19) / / / / / / / |
| 10) / / / / / / / / / / | 20) / / / / |

NAME

TEACHER

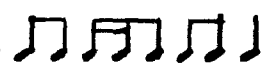
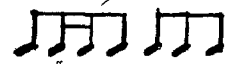
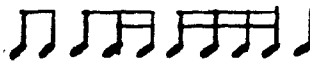
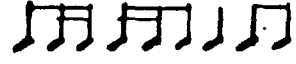
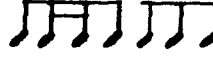
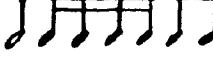
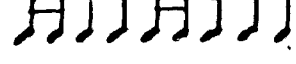
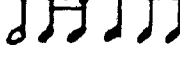
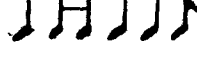
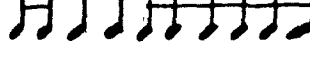
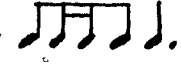
APPENDIX 3**Rhythmic Performance Test Directions**

In the following test, you will be shown 20 different flash cards. Each card has a different rhythmic pattern printed on it. Look at the whole card carefully. Say the rhythm silently to yourself, and then clap the rhythm out loud. Do the best that you can. Do you have any questions?

APPENDIX 3

Rhythmic Performance Test Patterns

(Each printed on a separate flash card)

- | | |
|---|--|
| 1.  | 11.  |
| 2.  | 12.  |
| 3.  | 13.  |
| 4.  | 14.  |
| 5.  | 15.  |
| 6.  | 16.  |
| 7.  | 17.  |
| 8.  | 18.  |
| 9.  | 19.  |
| 10.  | 20.  |

APPENDIX 3

Rhythmic Performance Score Sheet

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

13. _____

14. _____

15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

Scoring Key:

X = Incorrect Response

✓ = Correct Response

APPENDIX 4
Student Data Sheet

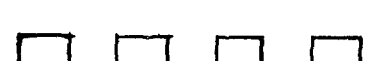
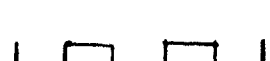
NAME _____

TEACHER _____

	PRETEST	POSTTEST	GAIN
RECOGNITION	_____	_____	_____
DICTION	_____	_____	_____
PERFORMANCE	_____	_____	_____

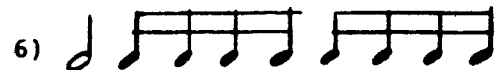
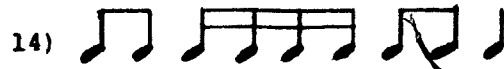
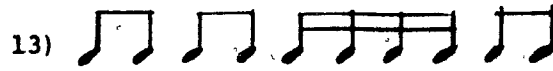
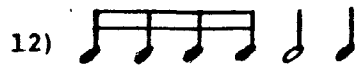
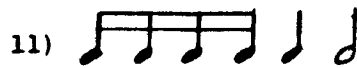
APPENDIX 5

Flash Cards - Lesson One

- 1) 
- 2) 
- 3) 
- 4) 
- 5) 
- 6) 
- 7) 
- 8) 
- 9) 
- 10) 
- 11) 
- 12) 

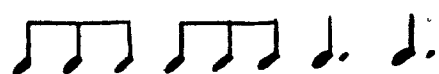
APPENDIX 5

Flash Cards - Lesson Two



APPENDIX 5

Flash Cards - Lesson Five

1) 2) 3) 4) 5) 6) 7) 8) 

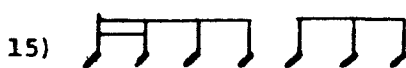
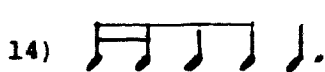
APPENDIX 5

Flash Cards - Lesson Six

1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12) 13) 14) 15) 16) 

APPENDIX 5

Flash Cards - Lesson Seven



APPENDIX 6
Dictation Exercise - Lesson One

Complete the rhythm of each example by adding stems and beams to the note heads:

1) ● ● ● ● ● ●

2) ● ● ● ● ●

3) ● ● ● ● ● ●

4) ● ● ● ● ● ● ●

5) ● ● ● ● ● ●

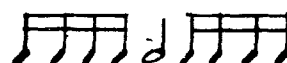
APPENDIX 6

Dictation and Recognition Exercise.- Lesson Two

Complete the rhythm of each example by adding stems and beams to the note heads:

1) 2) 3) 4) 5) 

Put a check on the box containing the rhythm you hear after each number is called:

1) 		
2) 		
3) 		
4) 		
5) 		

APPENDIX 6

Recognition and Dictation Exercise - Lesson Five

Put a circle around the rhythm you hear after each number is called:

	A	B	C
1)			
2)			
3)			
4)			
5)			

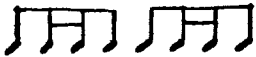
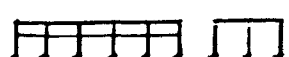
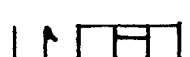
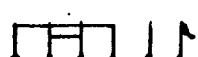
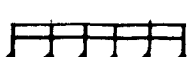
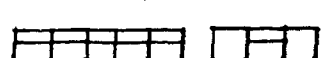
Complete the rhythm of each example by adding stems and beams to the note heads:

1)	
2)	
3)	
4)	
5)	

APPENDIX 6

Recognition and Dictation Exercise - Lesson Seven

After each number is called, put a check on the box containing the rhythm you hear:

A	B	C
1) 		
2) 		
3) 		
4) 		
5) 		

Complete the rhythm of each example by adding stems, beams, and flags to the note heads:

1) 

2) 

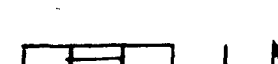
3) 

4) 

5) 

APPENDIX 6

Dictation Patterns - Lesson Eight

- 1) 
- 2) 
- 3) 
- 4) 
- 5) 
- 6) 
- 7) 

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