AN EXPLORATORY STUDY OF CHILDREN'S MULTI-SENSORY RESPONSES TO SYMBOLIZING MUSICAL SOUND THROUGH SPEECH RHYTHM PATTERNS

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The purpose of the study was to investigate the multi-sensory responses of children to symbolizing musical sound through speech rhythm patterns. The research problems were (1) to determine children's responses to speech rhythm patterns according to the differential sensory modes used; (2) to determine the children's responses to speech rhythm patterns by age, and (3) to compare children's responses to speech rhythm patterns by age and sensory modes.

Speech rhythm patterns consist of the number of syllables and the stress/nonstress relationships of these syllables in a word or a phrase. Three groups of six five-, seven-, and nine-year-old children respectively were observed in their use of speech rhythm pattern symbolization through visual, kinesthetic, and lingual means. All groups met for four weeks in daily thirty-minute music classes which consisted of song-game activities that focused on the work with speech rhythm patterns. Each session was video-taped, and through the tapes
and the transcripts of the lessons, children's responses were subjected to a quantitative and qualitative analysis.

Results of the study showed that individual and age differences did exist in the frequency, accuracy, and function with which the three sense modes were used. The kinesthetic mode was the mode most frequently used by each age, but was generally inaccurate as a response mode for the five-year olds. The visual mode indicated an obvious difference between the children's abilities to make a visual symbol for the sound pattern and their ability to follow a prepared visual symbol. The lingual mode showed less differences between age groups than the other two modes, and was the most accurate mode of response for the five-year olds. Due to individual difference among children, it was concluded that a multi-sensory approach to symbolizing sound patterns might be a more feasible teaching and learning tool than a single mode approach.
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CHAPTER I

INTRODUCTION, PURPOSE, AND PROBLEMS

The history of music education may be regarded as a series of efforts to find better ways of teaching music to children. One of the major questions in these efforts is how to make children musically literate. Note versus rote systems, shaped notes, sol-fa syllables, numbered scales, rhythm syllables, hand signs, and two-line staves are examples of techniques meant to simplify the music learning and reading process. The relative effectiveness of such techniques as tools for teaching music literacy, however, has not been clearly established.

Music literacy is the ability to transfer heard sound into written symbols and, likewise, to translate written symbols into produced sound. A person's skill in reading music requires the knowledge that the abstractness of sound can be represented by a variety of symbols. Traditional music notation is a rather complex and elaborate representation of sound which demands lengthy preparation through music instruction. Before children can begin to be proficient in the reading and writing of musical notation, they must be offered ways by which they can demonstrate what they perceive musically. This process of demonstrating sound
perception is, therefore, the first step in the instructional sequence of music literacy.

Representing perceived musical sound through symbols involves converting an abstract, aural experience into a concrete kinesthetic, visual, or aural-lingual demonstration of that perception. Work by experts in child development and learning supports the instructional need for concrete demonstrations of abstract thought. These concrete demonstrations are generally in the form of sensory-motor activities which allow the child to practice and act out the abstract by moving to it, drawing it, and saying or singing it.

In music, the above-mentioned concrete activities, or teaching and learning tools, serve as aids by which children can show how and to what degree they perceive musical sounds and patterns. Any technique which children use to demonstrate what they hear may, therefore, qualify as such a tool. Teaching and learning tools can utilize the kinesthetic, visual, and aural-lingual skills and abilities of children. When a child employs one or more of these senses to represent sound, he or she is said to be symbolizing, or representing.

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something with something else. Thus, various sense modes exist for concrete representation of abstract sound.

Musical sound can be represented through pictures or other visual symbols. It can be represented by movements of hands or other body parts, or imitated and labeled through speech patterns. These sensory symbols of musical sound become ways for the children to demonstrate what they perceive and, therefore, serve as preparatory training for reading standard music notation.

Many instructional systems in music education acknowledge the necessity of a sequence of musical learning that begins with the demonstration of sound perception by the child. These systems, however, seem to show differential preferences for the activities and sense modes by which the process of sound symbolization is best accomplished. The work of Dalcroze emphasizes movement as a means of musical expression and instruction. Texts reflecting the teaching methods of Kodaly often rely heavily on visual graphics to represent sound notation. Speech chants are a frequent part of Orff's methodologies, and are often combined with movement.

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2 Emile Jacques-Dalcroze, Eurhythmics, Art and Education (New York, 1930).


While evidence of kinesthetic, visual, and lingual teaching tools being used for music instruction is abundant, research on the influences of sense modes as learning tools for children is limited. Bastarache and Hill investigated the effects of visual aids as cues to perception in various musical tasks. Findings from both studies showed no improvement in learning when visual aids were added to the instruction. These results might indicate that visual tools in music learning are more incidental than necessary. In each of the studies, however, the visual aids were commercially prepared. It is conceivable that the results would have been different had the students or the teacher developed the visual symbolizations of sound according to the particular needs of their study. Perhaps the type of the visual symbol influences the contingent music learning.

Kinesthetic sound representation was the subject of studies by Cheek, Boyle, and Pardig as they investigated the influence of movement on music learning. Cheek and Boyle


concluded that movement does improve musical perception and performance. Fardig found that too much emphasis on one particular musical activity (movement) to the exclusion of a variety of experiences might retard rather than promote student learning and interest.

A study by Rainbow and Owens compared the kinesthetic abilities observed in pre-school children with common text book suggestions on appropriate rhythmic activities for this age group. In response to some of the widely published recommendations for movement activities with young children, the researchers concluded:

Tasks involving marching to music and marching and clapping to music were extremely difficult and the results of the study question the validity of using these activities as a means of teaching rhythm to three-year-old children.

Rainbow and Owens strongly challenged common techniques for symbolizing sound through movement. By allowing the children to show the facility with which they could perform a given task, the researchers studied what the children were


Cheek, p. 151; Boyle, p. 164. Fardig.


Ibid., pp. 7-8.
able to do with little training, rather than what the instructors were able to teach them to do. The report suggested that data distortion could result from testing knowledge or ability by using a response tool which is cumbersome to the student. Secondly, care must be taken in collecting data derived from methods which limit children's response modes, because conclusions may be drawn which are not truly reflective of what children are able to perceive and perform musically.

Compared to the research on visual and kinesthetic teaching tools, the lingual aspect of sound representation has received the least amount of attention in music education studies. Although anecdotal examples of speech as a tool for music learning may be readily obtained, few studies are available which address the topic of lingual influence on music instruction.

Rainbow and Owens stated that three- and four-year-old children were able to most successfully perform rhythm patterns by utilizing the vocal response with common speech patterns (Ex: [pattern] [pattern] [pattern] [pattern]). The children's level of accuracy continued to diminish with each addition of various motor responses to the rhythm tasks. These research results as well as those reported by Klanderman suggested that a verbal response of speech patterns familiar to the

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11 Ibid., p. 6.
student may be a more intrinsic way of recognizing and performing rhythm patterns than by kinesthetic means. It is possible that the already practiced skills with tonal and rhythmic inflections of speech provide an advantageous foundation for a transition to the less subtle tonal and rhythmic inflections of music.

It has been stated that by the age of nine years, a child has speech skills equal to or approaching those of adult grammar. This early facility with sophisticated and complex skills of speech could indicate an advanced development of the aural-lingual mode which is not approximated by the visual and kinesthetic as avenues for symbolization. If the study of symbols for sound is a tangible means toward music literacy, then it would seem logical to explore the speech mode as an effective and viable tool for sound representation.


The relationship of speech and music has long been recognized, but has seen limited application in music teaching methods. Speech is grouped into patterns of sound. Very simply, speech is situated onto high and low, loud and soft, long and short sounds illustrating the components of pitch, intensity, and duration. Pitch, intensity, and duration are fundamental elements of both musical tone and speech sound. In creating groupings of sound patterns, these three characteristics interact to the extent that isolation of any one element for study is difficult and probably distorting. The rhythmic production of these patterns causes the effect of "speech rhythm patterns."

Regarding the roles of the components of speech sound, Roberts stated that stress (accent, pulse, intensity) is possibly the simplest feature of speech to perceive and understand. "Stress is so important that if the speaker gets the stresses mixed up the result is likely to be nonsense." This prominence of stress as a major clue in sound perception is supported by the speech writings of Martin, Spring and Dale, Glanzer, Myers, and Erber and Witt

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15 Ibid.
as well as by the music writings of Manson, Mursell, Stetson and Tuthill, Stetson, Wedge, and Thackray.\textsuperscript{16}

Thackray stated:

The fact that most groups found Test 4 (accents) the easiest suggests that the accentual factor in rhythmic ability may be more fundamental or may develop earlier in untrained subjects than the factors of timing and duration.\textsuperscript{17}

The most essential function of stress or pulse in speech may be to provide the small patterns or unit groups within the larger, on-going flow of speech sound. The same has been suggested to be true in music.

It [experience of rhythm] requires that certain stimuli in a presented series shall be apprehended as accented. . . . The effect of accentuation is always to produce grouping; that is, it influences the non-accented members of the stimulus series and causes us to perceive them in definite relationships. This impression of grouping is one of the essential marks of the rhythm experience, and . . . the psychological unit of rhythm


\textsuperscript{17}Thackray, p. 26.
is not the accented stimulus itself, but the group of stimuli clustering about it in varied patterns.\(^1\)

Each person performs speech rhythm patterns with every normal vocal utterance. Although close similarities are suggested here between speech rhythm patterns and music rhythm patterns, there are some qualifications which need to be recognized and emphasized. The concept of a rhythm pattern used by this researcher differs from the commonly held notion that rhythm is arithmetic relationships of sounds. With the term "rhythm pattern," musicians may image a visual or aural grouping of measured, perhaps strictly performed differential note-values. Musicians have sometimes been trained to perform rhythm by calculating the length of the note and its location within the measure. Speech rhythm patterns are less contrived, particularly with regard to duration.

The qualities of speech rhythm patterns are mainly determined by the groups of sounds and the stressed sound within that group; therefore, the aspect of duration is subsidiary. For example, "Indiana" is a speech rhythm pattern which can match many other speech sounds (California, Merry Christmas, Where's my pencil?) and can be notated musically in several ways. Therefore, variation in tempo or syllable duration does not change the identity of the basic unit or the stress/nonstress relationship of the syllable.

\(^1\)Mursell, p. 150.
pattern. For these reasons, the aural-based speech rhythm patterns are temporally more flexible, less contrived, and more easily matchable than are "rhythm patterns" by the usual, musical definition.

The evidence which supports the speech and music sound pattern connections may help explain the reports of Rainbow and Owens and Klanderman which recognized children's ability to perform rhythm patterns more easily through speech than through other sense modes. If the use of speech rhythm patterns is accepted as a skill generally achieved prior to formal music instruction, then attention to these sound patterns as a possible means for musical growth is warranted.

In the present study speech rhythm patterns are assumed to be a viable technique through which the sound patterns in music can be symbolized by children. It is proposed that the tools by which this symbolization can take place should not exclude or over-emphasize one sensory mode. Rather, a multi-sensory approach is suggested in order to provide as wide a variety of responses as possible. For example, by asking such questions as, "Can you figure out a way to say David's name with your hands, feet, fingers, or head?" the teacher projects the possibility that familiar sound patterns of names and other words can be acted out and made concrete through movement. After practice with the

19Rainbow and Owens, p. 6; Klanderman, p. 112.
characteristics of how many sounds (syllables) are in the pattern and which one is stressed, the teacher can stimulate visual symbolization by asking, "If you could draw the sound of 'Happy Birthday' with the chalk, what would it look like?". Linguistically, the students are challenged to find another word or phrase that fits the pattern being examined; thus, the sound is the structure and the words which match it simply function as labels. Such strategies for problem-solving encourage the children to explore the alternatives for concretely representing familiar name and word patterns through kinesthetic, visual, and lingual sense modes.

Speech rhythm patterns are an integral part of virtually every speaking child; they inherently supply the components of pitch, intensity, and duration; and they naturally provide a learning aid for symbolizing musical sound. In recognizing these characteristics of speech rhythm patterns, this researcher suggests that they may provide children with a basic tool for responding to perceived musical sounds and for identifying familiar musical patterns in an unfamiliar musical context.

In the music classroom, the use of selected songs which do not distort the natural inflection and stress of speech could offer a valuable context for analyzing speech rhythm patterns. By employing a song to present the patterns of words, the components of relative pitch, intensity, and duration are held more constant and are emphasized to a
greater extent than in regular verbalizations. Repetition of a pattern is also often available through the form of the song or through the nature of the song activity. Speech rhythm patterns are initially introduced through familiar word settings within the song; however, a goal for the technique is to help children progress from hearing speech rhythm patterns within the song to hearing similar patterns in non-song or instrumental music. Therefore, music classes for children seem to be an appropriate setting for investigating sensory responses to speech rhythm patterns.

Thus far, it has not been systematically observed how children symbolize speech rhythm patterns in music. As an inherently aural phenomenon, speech rhythm patterns, like music, might best be learned by young students through multisensory activities for sound symbolization. There is a need to explore the characteristics of various senses (multisensory responses) in order to provide tools for symbolizing speech and sound patterns. In researching this question, both teacher- and child-suggested teaching tools ought to be considered.

Studies which examined children's abilities in responding to musical stimuli have frequently used populations of pre-school children. Such a subject choice is justified

in order to establish a taxonomy of characteristics in musical perception. No follow-up studies were found, however, which examined these same characteristics with school age children—a major focus of formal music education. The multi-sensory symbolization of speech rhythm patterns should, therefore, be investigated with school children of various ages. Such an undertaking could make it possible to strengthen the selection of techniques appropriate for music instruction and to clarify the methods which could most effectively promote music literacy in children. The present study is considered a first step in this direction.

Purpose of the Study

The purpose of this study was to investigate multi-sensory responses of children to symbolizing musical sound through speech rhythm patterns.

Research Problems

The research problems of the study were

1. To determine children's responses to speech rhythm patterns according to the differential sensory modes used.

2. To determine children's responses to speech rhythm patterns by age.

3. To compare children's responses to speech rhythm patterns by age and sensory modes.
Definition of Terms

Speech Rhythm Patterns—the grouping of sound patterns created by the interaction of pitch, intensity, and duration. The units of sound are determined by the number of syllables and the stress-nonstress relationship of those syllables. The rhythmic quality of these patterns evolves from the aural stress (intensity) factor and its location in the pattern. Therefore, the rhythm of these patterns does not fit a prescription of meter or measured syllable lengths. As a natural by-product of spoken language, speech rhythm patterns seem to be a structure for perceiving sound which is common to both speech and music.

Sense Modes—the kinesthetic (motor), visual (graphic), or aural-lingual (verbal) means by which perceptions are demonstrated. It is recognized that each sense possesses qualities of another (Ex: kinesthetic clapping can be seen—visual). The lingual mode is treated as a sensory response mode in this study, and although they may be primarily aural, verbalizations do involve the physical (kinesthetic) and the visual aspects of sound perception.

Teaching Tools—kinesthetic, visual, or lingual examples of sound symbolization. As techniques for making sound concrete, teaching tools (learning tools) offer children activities for demonstrating what they perceive through multi-sensory symbolization of musical sound.
Child-Suggested Teaching Tools—kinesthetic, visual, or lingual responses made by the children which are not in imitation of or suggested by the teacher.

Teacher-Suggested Teaching Tools—kinesthetic, visual, or lingual symbolizations of speech rhythm patterns which are presented to the students by the teacher.
CHAPTER II

RELATED LITERATURE

As a primary goal in music instruction, music literacy raises many questions about the nature of a child's musical learning. Considerations for dimensions of child thought and child development are, therefore, an integral part of the field of music education as music educators explore the contingencies of readiness for music literacy.

Music literacy is the ability to transfer heard sound into written symbol, and conversely, to produce sound according to the symbols of music notation. The traditional system of music notation is a very sophisticated and elaborate means of conveying musical sound; as such, it presents unique problems for teachers of young children.

In Tonal and Rhythm Patterns for Objective Analysis, Gordon leveled the charge that one origin of the note-reading problem in music education lies with music theorists who persist in relying on amusical, non-aural doctrines to explain rhythm.¹ "The terms simple, duple, compound duple... have been used almost exclusively in the arithmetic sense to

¹Edwin Gordon, Tonal and Rhythm Patterns for Objective Analysis (Albany, New York, 1976).
describe rhythm." It is not unusual to find instruction in music notation premised on the fractional relationships of whole notes, half notes, quarter notes, and eighth notes. The teaching of meter signatures and bar lines often include the non-aural calculation of note relationships; yet, some would argue that this carefully taught system of note-reading must be ignored when the student attempts to perform a musical interpretation of the written symbols.

A primary difference between an arithmetic approach and a musical approach to music reading and performance lies in the perception of note groupings. This difference is frequently discussed in terms of rhythm, although tonal elements may also be present. The rhythmic grouping of notes in an arithmetic approach is determined by non-aural note value relationships within a measure, while rhythmic grouping in a musical approach is a result of aural, interpretive principles.

What is rhythm? . . . The confusion is terrifying indeed. Teachers take their pupils to task for not playing "rhythmically." Rhythm, they imply, is inexorable strictness of time values, and they enforce it by counting, clapping, stamping irritably: one, two, three, and four. But other musicians tell us just the contrary: their "rhythm" is the willful deviation from deadly strictness.3

Rhythm is not a series of printed symbols. For practical purposes rhythm must be regarded as a unique kind of attitude toward a group of notes or printed symbols . . . Students are taught note-values. To be sure, this is important but the

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2 Ibid., p. 34.

missing ingredient is concepts for perceiving groups of notes. These are not taught.\(^4\)

Objections to the arithmetic approach may be common ("notes were made for man, not man for notes");\(^5\) yet educators of children have been offered few alternatives to this way of teaching music literacy. In lacking specific illustrations for Harris' idea of "concepts for perceiving groups of notes"\(^6\) teachers have often resorted to equating music reading with the identification of fractional relationships in note-values. What seems to be needed, however, is an approach for perceiving and performing sound which draws from a priori skills of the students. Such an approach might also offer a means for most expediently promoting the musical reading and performance of traditional notation.

Conventional musical notation is an extremely complicated code, and years of training are necessary for its mastery. Until it is mastered, it is an impediment to confidence. It is debatable whether we have these years to squander in a public education system. Ideally what we want is a notation that could be mastered in ten minutes, after which music could be returned to its original state—as sound.\(^7\)

In searching for ways to give musical symbols meaning for elementary students, teachers have developed techniques which intend to simplify the written symbols for sound and


\(^6\)Harris, p. 324.

incorporate activities for offering children concrete, sensory ways of perceiving sound symbols. These activities may be labeled as teaching aids or teaching tools, because they function as ways of recoding or interpreting musical information into perceptions understandable to children.

Although in traditional music notation sound is symbolized through a visual figure, it might also be represented through a movement or lingual pattern. The meaning of "symbol" is merely the representation of something with something else; therefore, musical sound may be symbolized through the kinesthetic (movement), visual (graphic), or lingual (verbal) sense modes. By symbolizing sound through the use of various teaching tools, educators attempt to help simplify the complex notation system and to offer ways for concretely demonstrating the abstractness of sound. The idea that sound may be expressed and represented (symbolized) through visual, kinesthetic, or lingual sense modes has been generally accepted in elementary classrooms. Few studies exist, however, which have explored the influence of these teaching tools on music learning.

Visual Teaching Tools

Various types of visual teaching tools are common in music instruction. Two studies investigated the influence of visual aids on music learning, and both used filmstrips as the teaching tool.
To determine the effects of related thematic material and visual aids on the ability to identify selected program music, Bastarache divided ninety-six students enrolled in fifth grade classes into four groups. Meeting separately, each of the four groups was randomly assigned a research condition for a total of six twenty-minute lessons.

Six recordings were chosen as the program music for the study:

1. *Sorcerer's Apprentice*
2. *Danse Macabre*
3. "On the Trail" *(Grand Canyon)*
4. "Street in a Frontier Town" *(Billy the Kid)*
5. "Hall of the Mountain King" *(Peer Gynt)*
6. "Dance of King Kastchei" *(Firebird)*

Each group was told the story and title of the composition as the piece was played. Additional stimuli were then given to all but the control group. Group Two heard excerpts which were then related to specific events or characters in the music. Group Three viewed commercially prepared filmstrips which told the story of the entire composition; and Group Four received both the excerpts and the filmstrip exposure.

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After two weeks the students were tested on title recognition of the six pieces. Results of the testing indicated that Groups Three and Four did not obtain significantly higher scores compared to the groups who did not receive visual clues. Consequently, Bastarache concluded that visual aids had little effect on his students' ability to identify the composition by title.\(^9\)

Bastarache's research focus was the influence of thematic association and visual aids on compositional recognition. With this dual treatment it would seem likely that the researcher intended to investigate in part the effects of the visual aids on learning. Little rationale was offered, however, for the inclusion of visual stimuli in music learning, and no speculation was proposed on the role or function which the visual tools may have played in thematic association or title recognition.

A 1972 study by Hill dealt with the influence of visual aids on music learning by investigating and evaluating the effectiveness of visual tools for teaching music appreciation at the college level.\(^{10}\) Hill cited the abundance of untested and unevaluated visual aids in music method materials as

\(^9\)Ibid., p. 56.

motivation for his research. As in the Bastarache study,\textsuperscript{11} commercially prepared filmstrips were used for Hill's visual presentations.

Seventy-two students enrolled in two music appreciation classes were involved in the study. Identical instruction was given to both classes except filmstrips were used with the experimental group. The filmstrips were selected from Basic Elements of Music by Busse and Good. Before conducting the study, Hill developed a class syllabus, lesson plans, and teaching procedures for both classes; critically evaluated and selected each visual aid used during the experiment; and selected Tests Three and Four of Colwell's Music Achievement Test (MAT) as the pre- and post-test instruments.

Hill reported only minor differences between the MAT scores of both groups after they had completed the semester course. None of the classifications of the student population (age, major, grade classification, sex, or Scholastic Aptitude Test (SAT) scores) showed significant differences when subjected to the t-test of significance.\textsuperscript{12}

A point which was unclear in Hill's procedures was his brief reference to an added filmstrip source, Audio Visual History of Music, and what role this source was intended to play in influencing the outcome of the MAT scores. Also, Hill referred briefly to the filmstrips being "outside classwork."\textsuperscript{13} Because no letter grades were given and

\textsuperscript{11}Bastarache. \textsuperscript{12}Hill, p. 63. \textsuperscript{13}Ibid., p. 42.
because it was unclear to what extent the students were expected to view the visual aids on their own time, one wonders how the level of the students' self-discipline and motivation to view the filmstrips influenced the results of the study.

In order to fully appreciate the scope and the particular qualities of the visual aids, it would have been helpful for the reader to have these made available. Without this type of reference point for examining Hill's study, it is difficult to fully assess the research results. Also, because examples of the filmstrips were excluded, Hill's recommendation for further research to determine which types of visual aids have the greatest impact on music learning could not be seen as an outgrowth of his research results.

Bastarache and Hill found little support for the positive effect of visual aids on music learning. One could question whether the results would have been different had the students been encouraged to create their own visual guides. This writer found no studies which intended to answer this question.

Elementary basic music series textbooks and supplementary materials provide an array of visual symbols most typically used with children. These symbols tend to be geometric shapes; pictures of familiar objects; pictures of objects which suggest sound (car, dog, phone); artistic abstract or

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14 Bastarache; Hill.
scenic graphics; alphabetical letters; or linear contours. Generally, the visual symbols fit one of two categories. Either the graphic represents the piece, a section, or a phrase of the music, or it represents individual sounds as in traditional music notation. To illustrate this point, one can consider a common visual clue for designating a section or phrase of music, "A." This symbol does not give information about performing or demonstrating the sound it represents; thus, it cannot be "read." Conversely, symbols such as "...0. ..0. ..0" provide performance information by designating the number of sounds in a group and the unique quality of one of the sounds. Though various interpretations of these symbols are possible, they can be read simultaneously with the sounds they represent. In the beginning steps toward music literacy, it would seem logical to utilize visual teaching tools that can be read in much the same fashion as traditional notation.

Kinesthetic Teaching Tools

Kinesthetic involvement in musical learning has had a powerful influence through the work of Emile Jaques-Dalcroze. A Swiss musician and music educator of the early 1900's, Dalcroze became known for his system of movement as a means for musical expression and instruction, Eurythmics. Gay credited Dalcroze with being the greatest influence on

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15Emile Jaques-Dalcroze, Eurhythmics, Art and Education (New York, 1930).
rhythmic movement in music education classes of American elementary schools.\textsuperscript{16} Although the ideas of Eurythmics are not necessarily the most common application of movement in current music education classes, they have served as a pioneer in giving attention to the legitimacy of movement as a means for musical expression and learning.

It is not clear how and to what extent movement affects learning; however, based on the wide speculation of the inextricability of movement and music, music educators have been encouraged to use movement as a teaching tool. Little mention has been made, however, of the limitations or age considerations for this sense mode.

One of the earliest published studies in motor response to music was conducted by Heinlein in 1929.\textsuperscript{17} Eight preschool children were asked to march on a pathway constructed for recording the electrical charge from a metal stirrup which was attached to one foot of the child. The music was provided by a player piano. Ten adult observers, who were graduate students in psychology, were asked to disregard the music and to tap a lever simultaneously with the child's step.


Results from the electronic recorder indicated that only two children synchronized their foot with the beat. The observers, however, thought all of the children were "keeping time" when, according to the electronic device, they were not. The observers were projecting their musical responses onto the children being observed. The electronic equipment could be considered rather primitive in construction by contemporary standards; the sample size was small; and having each foot stirruped could have provided different results than recording the pattern of only one foot. However, Heinlein's research proposed that marching to music, a common activity in many classrooms, was neither easily nor accurately accomplished by children.\(^\text{18}\)

Another study, similar in its intent to measure the accuracy of children in marching to an electronic piano, was conducted over a three-year span from 1931-1934 by Jersild and Bienstock.\(^\text{19}\) Seeking to avoid the direct observation problems of the Heinlein study,\(^\text{20}\) Jersild and Bienstock took "motion pictures" of the children as they walked and as they beat time with their hands to the music. An electrically operated clock with a hand that made a

\(^{18}\)Ibid., p. 227.

\(^{19}\)Arthur Jersild and Sylvia Bienstock, Development of Rhythm in Young Children (New York, 1935).

\(^{20}\)Heinlein.
complete revolution each second and a light that flashed with each accented beat in the music were also seen in the motion pictures of the child. The degree of synchrony between the clock, the light, and the child was used to determine the accuracy with which the musical beat was performed.

Reporting a test reliability of .80 and .75, Jersild and Bienstock recorded the responses of a total of ninety-four children from two to five years old. In addition to tempo being the greatest factor for accuracy and evidence of increasing accuracy with age, the researchers found no consistent difference between hand and foot accuracy in performing the beat of the music.

Results of the study led the researchers to caution:

Work in the field of motor rhythm with young children should not center directly upon the purpose of cultivating the child's ability to keep perfect time nor should it be restricted to a given meter, tempo or musical pattern.21

Conclusions from the studies by Heinlein and Jersild evoke the question of how the theories of those who consider movement an inextricable part of music should be applied to music instruction.22 Cheek and Boyle investigated some parameters of this question.23

21Jersild and Bienstock, p. 97.

In 1979, Cheek found that students' perception of music and their self-concept improved by incorporating creative movement, body rhythms, and hand gestures into music instruction. In a fifteen-week period, fifty-seven students from two fourth-grade classes were taught by the experimenter for ninety minutes per week. The main difference with the experimental group was that psychomotor experiences were considered the core aspect of their music instruction.

Three tests were administered to the two classes for pre- and post-test instruments, (1) Colwell's Music Achievement Tests (MAT), (2) Froseth's Response to Rhythm in Music Test, and (3) the Piers-Harris Children's Self-Concept Scale. Statistical treatment yielded differences at the .05 level of significance for the experimental group. It was concluded that the experimental group scored higher than the control group in tests of intervals, meter, and music reading, but were not more accurate in pitch, major/minor, and


24 Cheek.
tonal center discrimination. A significant gain score in self-concept was also found for the experimental group but not for the control group. These research results led the author to conclude that psychomotor activities have a positive impact on learning.

It is appropriate to note that the areas in which the experimental group excelled—intervals, meter, and music reading—can be effectively demonstrated through kinesthetic activities. The areas of major/minor, pitch, and tonal center seem more remote to the psychomotor experience. It is possible that this connection between the kinesthetic and the aural areas influenced the study results. Another "side-effect" of the psychomotor emphasis might be discovered by examining the lesson plans of the two groups.

With the experimental group, a positive teacher-student and student-student rapport seemed inherent in some of the suggested activities. Class situations which encouraged thinking of ways to move to sound; students' leading echo-clapping activities; and combining and sharing ideas for movement were included for the experimental group and not the control group. Such activities may tend to create a motivational environment for students, and this fact may help explain the gain score in self-concept for the experimental group.

Cheek, p. 151.
The effect of foot-tapping to the beat and hand-clapping to the rhythm as a method for practicing rhythm patterns was investigated by Boyle.\textsuperscript{26} The researcher was interested in whether or not this type of prescribed movement would aid instrumentalists in reading and performing rhythms.

The eighteen-week study employed twenty teachers of junior high school training bands. Twenty-four bands from twenty-two schools were organized into two matched groups of twelve bands each. The matching criteria were amount of rehearsal time per week, size of the band, and years of teaching experience for the director. The experimental and control groups received equal amounts of rehearsal time and instruction from the same method books. In addition, treatment for the experimental group incorporated

1) listening to recordings of music to recognize the beat
2) marking time to the underlying beat
3) training in the use of the foot to mark the beat
4) clapping rhythm patterns while tapping the beat with the foot
5) playing the rhythm pattern on a single note while marking the beat with the foot.\textsuperscript{27}

These experimental activities were incorporated into a ten-minute segment of normal rehearsal time and amounted to thirty minutes per week for the semester. The \textit{Watkins-Farnum Performance Scale} (WFPS) sight-reading test was used as the pre- and post-test measurement.

\textsuperscript{26}Boyle. \textsuperscript{27}Ibid., p. 58.
Boyle reported a significant gain (p<.01) for both groups in the pre- and post-test scores. Results also showed a significant difference in the experimental group (p<.01) on the WPPS with rhythmic aptitude, intelligence, and pre-test scores held constant. Therefore, results of Boyle's study would lend support to the use of movement as a tool for music instruction. A question remains, however, of whether techniques such as foot-tapping and hand-clapping are appropriate and effective when used with young children for instruction in rhythm.

In a 1966 study by Fardig, an experimental group of third grade students was offered nine weeks of daily Eurythmic experiences, while a control group received similar lessons without any body movement. Of the 271 students tested, students in the control group exhibited higher music interest and creativity at the end of the study than those in the experimental group.

Fardig concluded that too much emphasis on a particular aspect of the musical experience to the exclusion of variety in activities and focus can conceivably retard student learning as well as interest. This point addressed the hazards of separation of or over-emphasis on one type of teaching tool at the neglect of the others, and perhaps implied some cautions for research methodologies.

The conclusions drawn by Fardig seem to have import in all studies investigating children's abilities and responses to music. It would seem reasonable that studies which are constructed to measure how well students can learn a particular technique or the impact of a certain technique on learning, tend to focus and channel responses toward that end. Within the time limit of a study, the range of classroom experiences may be considerably limited to the scope of the study technique. When this happens it is more likely that spontaneous pursuing of student ideas, allowance for student interpretation of and experimentation with the technique, and flexibility to follow the suggestions and ability levels of the students can be greatly diminished.

The tendency to over-emphasize a given technique in research methodologies could be partially remedied by allowing a sufficient time span to include activities for student interest and motivation which may be rather peripheral to the study purpose. Secondly, descriptive rather than experimental studies may be less confining in the scope of classroom activities and student responses.

A three-year project by Rainbow and Owens was one of only a few studies found which sought to observe what students were able to do in responding to music rather than what they could be trained to do.29 Rainbow and Owens suggested that

for preschool children the suitability of kinesthetic activities as aids to musical learning varied according to the type of movement. The study challenged recommendations for rhythmic activities commonly found in various method books.

A total of seventy-seven three-year-old and seventy-three four-year-old children participated in the three-year study. Music lessons of fifteen minutes were offered two or three times per week, and video-tape equipment was used to record student responses to tasks. Three video-taped recordings of each child doing the rhythmic tasks were obtained for each school year. Three judges evaluated task success, and inter-judge agreement averaging 94 percent was reported. Analysis of the data was reported in percentages for the children's task accuracy levels. Analysis of variance was used for comparing abilities of age groups and for estimating the effect of training (practice) on students' abilities in task success.

Fourteen tasks were selected for the investigation. Tasks One through Five required the subject to produce eight consecutive steady beats synchronized with recorded piano music. The various activities for these tasks included clapping hands, slapping hands on knees, marching, clapping hands while marching, and tapping rhythm sticks. Tasks Six, Seven, and Eight presented familiar words on the rhythm patterns of \[\text{J J J J J J J J} \] and the
children were asked to vocally echo these vocal/rhythmic patterns. Tasks Nine, Ten, and Eleven required subjects to clap the patterns immediately after they had vocalized the rhythm. In Tasks Twelve, Thirteen, and Fourteen the teacher clapped one of the three rhythm patterns of Tasks Six, Seven, and Eight and asked the children to echo-clap the same pattern. Tasks Twelve, Thirteen, and Fourteen involved no vocal clues.

Rainbow and Owens found that marching to music and marching and clapping to music were nearly impossible for the children to perform accurately. Findings led the researchers to question the validity of using such tasks to measure or to teach rhythmic skills in early childhood. Rainbow and Owens reported that children were able to perceive and duplicate a rhythm pattern only if a proper method of response was utilized.

Most of the modes of responses tested in the study (marching and clapping, echoing a pattern) are common activities in many music classrooms. As indicated by the research, if a child's ability to reproduce a rhythm pattern were measured by only one of these methods to the exclusion of the others, it could be mistakenly assumed that the learning of a rhythm pattern was too difficult for preschool children. Rainbow and Owens did not suggest that the learning of rhythm patterns was too difficult for these children,

\[30\text{Ibid., p. 6.} \quad 31\text{Ibid., p. 7.}\]
but that many of the tools which were imposed by the teacher caused the problems in the task success.\textsuperscript{32} Accuracy in performing rhythm patterns was highly dependent on the particular response modes the children were asked to use; and, though the primary mode of response for the study tended to be kinesthetic, the tasks which allowed responses in the lingual mode were most accurately performed. These research results would seem to verify the need for further research on lingual tools for music teaching.

Lingual Teaching Tools

Results of the Rainbow and Owens research indicated that a majority of the three- and four-year-old children were most successful in performing a rhythmic task using a vocal response.\textsuperscript{33} For the three tasks employing a vocal response, 50 percent of the three-year-old and 70 to 90 percent of the four-year-old children successfully completed the rhythmic patterns. The next highest success rate for the children in other tasks was 10 to 14 percent for the three-year-olds and 40 to 60 percent for the four-year olds. "The results of the study would also suggest that vocal chanting is an appropriate means for teaching rhythm activities to young children."\textsuperscript{34}

Similar conclusions about the appropriateness of the vocal mode for performing rhythmic tasks were reported by

\textsuperscript{32}\textit{Ibid.} \hspace{1em} \textsuperscript{33}\textit{Ibid.}, p. 6. \hspace{1em} \textsuperscript{34}\textit{Ibid.}, p. 7.
Klanderman in 1979. The purpose of the study was to "examine some of the details of the process by which children learn music, especially when they become capable of recognizing and producing various musical elements." Two pilot studies and a main study were conducted to investigate the auditory capacity of preschool children to perceive pitch, rhythm, and melody in music. Both pilot studies intended to check the feasibility of the melody and rhythm tasks, the instructions to the children and the activities for familiarizing the children with the terms "similar" and "different."

Seventeen three-year-olds, twelve four-year-olds, and eighteen five-year-olds participated in the main study. A series of recognition and performance tasks were used in the areas of pitch, rhythm, and melody. The stimuli were presented on a tape recorder, and the children's responses were recorded on a second tape recorder. Recognition tasks presented two examples per item which the children were to determine as being same or different. Performance tasks requested the children to imitate the stimuli by singing the examples. A multivariate analysis of variance yielded significant differences in rhythm recognition, melody recognition, pitch performance, and rhythm performance. No


36 Ibid., p. 3.
significant differences were found in responses to pitch recognition and melody recognition.

A primary difference between the above study and others conducted with young children was the use of the voice as the response mode and the presentation mode of all tasks.

This study required the young child to perform rhythms using the voice. Previous studies conducted regarding the rhythmic abilities of the young child required the child to perform rhythms by hitting an instrument. A study should be set up to examine the advantages of both types of responses and to evaluate if one technique is more accurate than the other in testing rhythmic ability.\textsuperscript{37}

Klanderman neglected to give the reader information on what types of vocalizations were used by the researcher in the taped stimuli or by the children in their responses. As a major tool in the methodology, the lingual response mode was not given sufficient explanation, description, or discussion in this study. Therefore, the impact of the study results is difficult to interpret as a consequence of this omission. The statement, "children can perform rhythm with their voices and don't necessarily need instruments or hand clapping" was not adequately supported nor discussed within the research conclusions.\textsuperscript{38}

Compared to studies on the effectiveness of kinesthetic and visual teaching tools for music learning, the lingual aspect of sound representation has received surprisingly little attention in music education research. Speech patterns

\textsuperscript{37}Ibid., p. 121.  \textsuperscript{38}Ibid., p. 112.
as a technique to perform Indian drumming, rhythmic notations, musically intricate phrase patterns, and compositional nuances in jazz improvisation may improve musical performance, but they have not been subjected to empirical research. Lingual involvement in music learning, whether acting as a tool for music instruction or as a means for music response, needs further investigation.

Gordon proposed that verbal association is basic to the generic function of discrimination in music.\textsuperscript{39}

It is impossible to engage fully in the higher levels of learning if verbal association with what we hear and perform is not established. Consider again the analogy of the spoken language. Without words (names) to represent the multitude of objects in our environment conceptualization would take place in only a minimal way. One thinks with words; the fewer words in one's vocabulary the more limited one's thinking.\textsuperscript{40}

Although Gordon's argument is convincing for verbal association in music learning, no procedure or system was found which offered application of this theory.

Typical applications of speech or verbal association in music instruction tend to fit one of three general approaches. First, speech is used to perform and identify tones and rhythms in music, and secondly, words are affixed to a prescribed rhythmic pattern for chanting or singing. A third usage entails deriving traditional notation from the chanting of common speech patterns.

\textsuperscript{39}Edwin Gordon, Learning Sequence and Patterns in Music (Chicago, 1977).

\textsuperscript{40}Ibid., p. 10.
Application of speech to note identification may be seen in the systems of chanting for rhythm reading. Generally three systems are used—chanting meter (one two and three four); note values (quarter eighth-eighth quarter quarter) or rhythm syllables (ta ti-ti ta ta). A problem in performing rhythm according to the note-value system is the discrepancy between the one-syllabled sound of a quarter note ($\mathbf{J} = \mathbf{X}$) and the two-syllabled sound of the matching label (quarter = $\mathbf{Xx}$). In using speech as a tool for performing rhythms it would seem to be a desirable standard to avoid distortion in both the rhythm pattern and the speech pattern.

The second and third applications of the lingual mode in music instruction may be seen in activities which derive rhythm notation from speech patterns or affix speech to a set of traditional rhythm symbols. In both cases, the speech is contrived to fit a notated rhythm pattern.

"The Happy Farmer"

\[
\begin{align*}
\frac{4}{4} \quad \text{Let the mighty and the great} \\
\quad \text{Roll in splendor and in state}\end{align*}
\]

In the above example, the teacher is encouraged to have the students say the poem "expressively," even though the rhythm of the words is fixed by the notation and meter.\textsuperscript{42} One could question the validity of instructing children in

\textsuperscript{41}Eunice Boardman and Beth Landis, Exploring Music--Book Four (New York, 1971), p. 57.

\textsuperscript{42}Ibid.
rhythmic notation by having them produce metered speech in this way and implying a "correct" musical meter and notation for speech sound.

In considering an appropriate application of the lingual mode to music instruction, it seems an important prerequisite that the verbal clues be simple for children to perceive and perform. A lingual system developed to aid music literacy would also allow interpretive performance of the musical patterns by natural pronunciation of the word patterns. Stetson supported a taxonomy of speech patterns for the formation of such a system, especially for the development of rhythmic accuracy.43

The perception of rhythm is one of the difficulties in the rapid comprehension of musical notation and in the execution of musical material. The problem can be attacked more directly. If the rhythms are analyzed into a few fundamental figures with which the pupil becomes familiar in all their various guises and combinations, there is no reason why the average pupil should not make rapid progress with rhythm. Verse is the natural precursor and basis for the study of musical rhythms.44

Stetson and Mursell proposed lingual teaching tools which carried with them the possibility of extending accurate reading of notation to musical interpretation of notation patterns.45

44Ibid., p. 190.
The measure and its subdivision is a foreign thing to the beginner, but he is always familiar with verse rhythm, and it should be possible to make use of this familiarity in teaching musical rhythm.  

Yet another application of the fact that rhythmic training readily and completely transfers is found in the practice of learning musical rhythms in forms of words. Nonsense words are concocted which embody the rhythmic pattern of a musical passage, and the rhythm learned through the words transfers effectively to the performance of the passage.

Support for kinesthctic and visual teaching tools tended to focus only on the goal of accurate performance of notation. Verse and natural speech rhythm was championed as being able to aid in less mechanical and more effective learning and performance of rhythm patterns.

It seems logical to assume that intermediary steps may exist between speaking the "freer" rhythmic patterns of language and writing these patterns by affixing them to the arithmetic structure of musical notation. It may be possible to use speech to enhance the musical performance of notation rather than confine speech to the same limitations which are typical of the metrical system.

Speech may be a viable teaching tool for demonstrating musical perceptions, and it may provide a structure which could aid in the perception and performance of musical patterns. A rationale for the assumption that speech might

46 Stetson, p. 182.  
47 Mursell, p. 169.  
48 Tobias Matthay, Musical Interpretation (Boston, 1913), pp. 27-38.
offer a systematization for perception and interpretive performance of music is offered in the following section of this chapter.

Characteristics of Speech

The nature of speech is sound. The flow of sound in speech production is organized into groups as a result of pronouncing words and phrases. Components of word production are pitch, intensity, and duration. The high and low, loud and soft, and long and short characteristics of speech combine to create patterns or intonation groups. As in music the interaction of these components in speech causes a rhythmic pattern of sound or speech rhythm patterns. Speech rhythm patterns are an inherent quality of speech sound and, according to speech acquisition research, are possibly the earliest perceived and produced characteristic of speech. 49

There are writers who theorize that the presence of patterns created through the rhythmic quality of speech sounds is more basic to learning than merely as means for recognizing other, similar sound patterns. Neisser's theory proposed

that memory is reliant upon storage of information in
temporal patterns (rhythm patterns) which are frequently
linguistic in nature.\(^{50}\)

A rhythmic pattern is a structure, which serves as a
support, an integrator, and a series of cues for the
words to be remembered. At the risk of being old-
fashioned, it is worth emphasizing that such a struc-
ture is a whole, greater than the sum of its parts.
The parts (individual beats) get their meaning
(relative position) from the whole, even though that
whole does not exist at any moment of time. It
exists, as one might say, in the subject's mind,
as an intent, a Gestalt, a plan, a description of
a response that can be executed without further
consideration.\(^{51}\)

Neisser goes on to say:

Spoken language is built upon "syntactic" organizations
of this sort, whose complexities are currently being
unraveled by linguists. This is not coincidence. My
hypothesis is that the processes of spoken language
are continuous with those of active verbal memory;
that the "synthesis" postulated in certain theories
of speech perception involved the same capacities and
mechanisms as the synthesis of a rhythmic pattern in
a memory-span experiment.\(^{52}\)

A conversion takes place, according to Neisser, which
changes even non-lingual stimuli into linguistic form for
easier memory storage by "prolonging its life at the cost of
changing its nature."\(^{53}\) This theory would suggest that
purely visual, kinesthetic, or aural perceptions may be
translated or recoded into verbal terms in order to memorize
the object, movement, or sound for later transmissions.

\(^{50}\)Ulric Neisser, Cognitive Psychology (New York, 1967),
pp. 199-265.

\(^{51}\)Ibid., p. 235. \(^{52}\)Ibid. \(^{53}\)Ibid., p. 22.
Neisser's theory seems to hold some implications for speech and music research dealing with perception and recall of patterns. Verbal clues for sound patterns either through a priori labeling abilities of the subjects or presentation in the sound stimuli could possibly help to improve musical pattern recall, and in turn, performance. These verbal clues might best be provided in the form of common word patterns which by their inherent length and stress pattern relationship, convert aural rhythm patterns accurately into speech rhythm patterns.

Although an 1893 treatise by Bolton and a 1902 article by McDougall attempted to show how and to what extent rhythm underlies all mental activity and what part it plays in physiology and nature, substantive evidence on the role of rhythmic patterning in learning has been provided in more recent research.54 Sometimes referred to as "chunking," the process of organizing information into groups for memory and recall seems widely acknowledged.55 Investigations of this type of mental processing are particularly evident in speech research, perhaps because speech itself offers inherent rhythmic unit groupings.


Glanzer reported that "subjects will form intonation groups whether they wish to or not in the speaking of a series of words," and that this effect influences long-term and short-term storage for recall.\textsuperscript{56} Neisser stated that a subject will group information for memory even if the stimulus itself is not grouped.\textsuperscript{57} The theory of information processing by patterning was investigated by Glanzer.\textsuperscript{58}

Glanzer's research on intonation grouping and meaning relations promoted the patterning theory of information processing.\textsuperscript{59} Two experiments with ninety college students presented series of words (triplets) grouped by intonation and word meaning. Some intonation groups were out of phase with word meaning in order to test the influence of this interaction. After the presentation of stimuli, the students were tested individually and asked to write the words he or she could recall. Results of the two experiments led Glanzer to reaffirm his position that the phenomenon of intonation grouping sets up the initial processing units for retention and recall.

\textsuperscript{56}Murray Glanzer, "Intonation Grouping and Related Words in Free Recall," \textit{Journal of Verbal Learning and Verbal Behavior}, XV (1976), 85.

\textsuperscript{57}Neisser, p. 233.

\textsuperscript{58}Glanzer, PP. 85-92.
Additional studies by Laughery and Spector, Ryan, Michon, Wickelgren, Miller, and Buschke offered supportive evidence to the proposal that subjects tend to group aurally presented stimuli. Two recurring conclusions from the cited research were (a) that rhythm (perhaps lingually rooted) is at the base of information storage and recall, and (b) that the pattern (rhythmic grouping) onto which stimuli are situated actually expands a person's recall capacity.

One might expect the pattern to act as an additional burden on memory, but it does not. When the subject stores a grouping pattern as well as eight digits, he finds his task easier than the eight digits would be alone! . . . Remembering a rhythm in this way does not take up room in the memory span—on the contrary, it creates room in an active memory which otherwise would hardly exist.

Miller considered the pattern an added "bit" which, through its category characteristics, extended a person's "channel capacity" for stimulus recall. Wolff illustrated the point of channel capacity being aided by information bits (patterns). The following strings of letters should be viewed, then, with eyes closed, recalled: xmahq; tdlibcj;


61 Neisser, p. 233. 62 Miller.

The results tend to differ if this string of letters is memorized in the same way: thechickenscratchesin-theyard; immaculatemotorcarsforsale.64

Suddenly one's memory span for letters is much larger and it is obviously because we can recognize words already known and remember the letter sequence in terms of the words.65

Neisser, Wolff, Glanzer, and Miller are in agreement on the phenomenon of intonational patterning (pitch, intensity, and duration) as a basis of information perception, storage, and recall.66 Although theories exist which claim the need for a patterned approach to music learning, only a few studies are available which examine the effect of patterning on music perception, recall, and performance.67

Discussing "Memory and Attention in Music" Deutsch proposed that the hierarchical structure of music is a major factor in promoting a configurational approach to music.

64Wolff, p. 108. 65Ibid.

66Neisser; Wolff; Glanzer, Miller.

learning, and that a central factor in music attention is the formation of note linkages or groups for perception. Gordon's work with the development of a taxonomy for tonal and rhythmic patterns has been perhaps the most extensive in dealing with the subject of patterning in music learning.

One cannot learn to meaningfully read and write music by dealing with individual notes on a theoretical basis or by memorizing definitions of music symbols and terms. The ability to audiate patterns in given tonalities and meters must precede music reading.

Throughout his publications Gordon contends that "the basic units of music are tonal and rhythm patterns (not individual notes or tones)." Although Gordon has worked toward establishing an order for rhythm and tonal pattern presentation, few other studies indicated concern for this approach to music instruction and learning.

Music instruction seems to warrant a patterned approach in the teacher's presentation of materials, as well as in the students' own means for perceiving stimuli. The small, familiar sound patterns which are inherent in speech are structures which are already a part of the child's skill before he or she typically begins music instruction. Therefore, it seems logical for music educators to foster this sound skill development by capitalizing on its contributions to music learning.

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69 Gordon.

70 Ibid., p. 5.

71 Ibid., p. 9.
When one considers the determining characteristics of a pattern and in particular of a speech rhythm pattern, it seems that stress serves a very basic and vital function in the creation and perception of sound groupings. "Stress is so important that if the speaker gets the stresses mixed up the result is likely to be nonsense." 72

Lieberman has researched the phenomenon of stress in speech rhythm patterns and provided a graphic illustration of this effect through the spectograph appearing in Figure 1. 73

![Fig. 1—Spectograph of Speech Stress](image)

J. G. Martin studied the hierarchical relationships of speech sounds in a simple phrase according to the relative stress. 75 Although his notational choices could be challenged,

72 Roberts, p. 229.


74 Ibid., p. 72.

Martin related stress shift to phrase meaning by using musical notation (Figure 2) for illustrating his point.

![Musical Notation](image)

**Fig. 2—Four rhythmic versions of the "same" sentence.** (The underlined word has been emphasized.)

Woodrow claimed that intensity has a group-beginning effect; duration a group-ending effect; and that pitch has neither a group-ending nor a group-beginning effect. The theories of Lieberman, Martin, and Woodrow on the substantial influence of stress in speech patterns are given empirical support through a study by Erber and Witt and one by Spring and Dale.

In 1977 Erber and Witt reported a study involving ten severely and ten profoundly hearing-impaired children ranging

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76Ibid., p. 495.


78Lieberman; Martin; Woodrow; Erber and Witt; Spring and Dale.
from age nine to thirteen.\textsuperscript{79} Having had at least six years in oral/aural schooling, the students were presented with ten monosyllabic, ten trochaic, and ten spondaic words. Visual symbols representing these patterns were displayed respectively before the students—\textsuperscript{[1]} \textsuperscript{[1]} - \textsuperscript{[2]}; and \textsuperscript{[1]} - \textsuperscript{[2]}. Two methods were used to evaluate word perception: (a) percentage of words recognized correctly and (b) percentage of words categorized correctly as to stress pattern.

A typed list of familiar words with stress pattern categories was displayed before the student at all times. After being asked to identify the stress category and specific word, the child was to respond by pointing to and saying the word. All students were tested alone.

Results of the study indicated that for the profoundly deaf group, the word-recognition scores were low regardless of sensation level (SL), but their perception of the stress patterns of words improved as a function of increased intensity.\textsuperscript{80} Apparently, this ability to discriminate stressed sounds in speech occurs shortly after birth in hearing children.\textsuperscript{81}

Spring and Dale investigated "Discrimination of Linguistic Stress in Early Infancy" by using the High Amplitude Sucking (HAS) paradigm with 120 infants from one- to four-

\textsuperscript{79}Erber and Witt. \hspace{1em} \textsuperscript{80}Ibid., p. 277.

\textsuperscript{81}Spring and Dale.
months old. The study was to evaluate the abilities of the infants to discriminate between the di-syllables BA-ba and ba-BA. The artificially synthesized syllables differed solely in location of the stress. Spring and Dale found that the infants were able to discriminate the acoustic correlates of stress location with no apparent experience in producing these particular sounds and no reinforcement for this form of responding.

The writings and research of Roberts, Erber and Witt, Martin, Lieberman, and Spring and Dale seem to be conclusive about the impact of stress on creating sound groupings; the facility with which the stress is perceived and the pervasion of rhythmic patterns created by stress groupings in speech sound. Certainly, music also contains pervasive rhythmic patterns whose nature is affected, if not determined, by the stress component. Research is available which examined the abilities of children to perceive the aspect of stress within a music context.

**Stress Patterns in Music**

Speculation that amplitude discrimination and the stress factor of speech rhythm patterns could provide an apparatus for recognizing patterns in musical sound has received supportive evidence from studies by Riley and others, and

82Ibid. 83Ibid., p. 231.
84Roberts; Erber and Witt; Martin; Lieberman; Spring and Dale.
First grade and third grade children were the subjects of two experiments by Riley, McKee, Bell, and Schwartz. Three hypotheses gathered from previous research were to be challenged: (1) it is easier to learn amplitude discrimination than frequency discrimination, (2) a transfer after learning produces more transposition in amplitude than frequency, and (3) subjects can arrange stimuli of different amplitude in order from weak to intense but cannot arrange different frequencies from low to high.

The first experiment involved twenty-four first- and third-grade students. Pre-training included visual aids to help students prepare for the two-fold treatment of the test instructions. Students were asked on some items to choose a sound higher, lower, louder, or softer than a given sound and this treatment was termed "relative" instructions. On other items, the students were asked to identify the same sound through "absolute" instructions. These two treatments of the test instructions were considered transfer (relative) learning and retention (absolute) learning.

Tones were produced by an oscillator and played for the students on a tape recorder. No report was made of the response modes or test situation for the students. Test

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86Riley and others.

87Ibid., p. 581.
results of Experiment I indicated (1) that amplitude discrimination was better than frequency discrimination $F(1,44)=7.54$, $p<.01$; and (2) that relative instructions were better than absolute instructions $F(1,44)=31.89$, $p<.01$.88

A second, similar experiment with thirty-two first- and thirty-two third-grade students yielded results in agreement with Experiment I. The research findings led the authors to conclude,

The previous findings and the present ones suggest that subjects, regardless of the degree to which they can describe the dimensions of pitch and loudness, are more able to make relational responses to the latter than to the former.89

Another study which documented the facility with which children can discriminate amplitude was published in 1969 by Thackray.90 In an investigation of the rhythmic abilities of 1,560 children, Thackray found that the easiest in a series of six tests was that which examined perception of "strong and weak sounds."91 The six areas of rhythmic ability tested were (1) counting, (2) steadiness, (3) long and short sounds, (4) comparing rhythms, (5) strong and weak sounds, and (6) phrasing.

Eight age groups of students (eight to fifteen years) plus four other groups not categorized by age were most accurate in Test Four (strong and weak sounds). The ten-item test presented a pattern of chords played as the

88Riley and others, p. 582. 89Ibid., p. 587.
90Thackray. 91Ibid., p. 25.
stimuli. A series of dots on the answer sheet represented the chords played, and the students were asked to draw a slash through the dot which was strongest (accented).

Thackray reported a reliability of .69 for the ten-item accent test, and .88 reliability for the whole series of six tests. The results of the study led Thackray to conclude, "The fact that most groups found Test 4 [accents] the easiest suggests that the accentual factor in rhythmic ability may be more fundamental or may develop earlier in untrained subjects than the factors of timing and duration."92

Perception of the accent in speech and music patterns seems to be a primary means of recognizing and recalling presented stimuli. In a musical setting, as in speech, the cause of the accent which determines the grouping is variable.

Accents may occur on short notes as well as long, on soft notes as well as loud, on lower notes as well as higher ones, and irregularly as well as regularly. In short, since accent appears to be a product of a number of variables whose interaction is not precisely known, it must for our purposes remain a basic, axiomatic concept which is understandable as an experience but undefined in terms of causes.93

Like speech, the intonation pattern of music is an almost inextricable combination of pitch, intensity, and duration. Although it was this combination which figured prominently in the stress grouping perception and recall of

92Thackray, p. 49.

the speech students, music educators sometimes attempt to separate these factors for teaching the elements of music.

It is not unusual to find evidence in music classes and music texts of rhythm being taught separately from tone. It is understandable that some separation of rhythmic and tonal qualities of a sound are needed for clarification; however, exploring the rhythm of speech patterns and the speech of rhythm patterns (especially within a song context) almost invariably combines both rhythm and tone into speech rhythm patterns. Research and opinions are available which support this combination.

The perception of rhythmic completeness and incompleteness by 2,207 seventh, ninth, and eleventh grade students was the subject of a study by Boisen. Each of fourteen selected rhythmic units was presented to the students under three conditions: (1) by itself, (2) as part of a melody whose sequence of pitches matched the completeness or incompleteness of the rhythm pattern, and (3) as part of a melody whose sequence of pitches did not match the completeness or incompleteness of the rhythm pattern. Two pilot studies were conducted to verify the author's perception of complete and incomplete items; and, from item analysis, test items for the final study were selected.

With a test reliability of .60, Boisen reported a significance level of .01 from a t test measuring the accuracy difference when a rhythmic unit was accompanied by a melody. Boisen concluded:

It would seem that rhythmic completeness and incompleteness are perceived most accurately in a melody whose sequence of pitches matches the completeness or incompleteness of the rhythm; less accurately in a rhythm which is heard by itself; and least accurately in a melody whose sequences of pitches does not match the completeness or incompleteness of the rhythm.  

Although Boisen's selection of rhythmic units was based on Petzold's longitudinal study, Petzold reported conflicting results. By having 331 first through sixth grade students (1) tap in response to a tapped pattern, (2) tap in response to a pattern played on piano, and (3) sing in response to a pattern played on piano, Petzold found no significant differences in response to stimuli embodied in tone. "The ability to reproduce rhythm patterns that have been presented aurally is not strongly influenced by either mode of presentation or the mode of response."  

In an early study Vidor found that the abilities to tap responses to a rhythm pattern and to a melodic rhythm pattern were largely distinct from each other.  

95Ibid., pp. 153-154.  
97Ibid., p. 224.  
98Martha Vidor, Was 1st Musikalität? (Munich, 1931).
sway of 156 university students with the Miles Ataxiameter to determine the relative effects of rhythm embodied in tone, Husband found one-third as much sway with pure rhythm as with melodic rhythm. 99 Supporting the notion of combining rhythm and tone for musical perception, Lundin claimed his rhythm test "is different from any other rhythm test in that it does not isolate the rhythm from the melody." 100 In Tests of Musical Ability and Appreciation, Wing succinctly stated his position on the combination of rhythm and tone, 101 "As music can hardly be said to exist without tonal variation, musical rhythm can only truly be said to be present when it is associated with tones." 102 Although the cited research suggests that students may be more responsive to melodic rhythm, it is common practice in music classes for rhythm and tone to be taught separately. A reason for this approach may be the inevitable probability that the students will be tested on them separately. As Bentley pointed out, it may be the problem of measurement which influences music teachers to

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102 Ibid., p. 25.
approach rhythm and tone as isolated elements for the purpose of instruction.  

If measurement is to be made, both that which is measured and the terms in which it is to be measured must be specific. We can measure in inches, in ounces, in litres, separately and specifically; but there is no single, composite, meaningful measure of all three together. Similarly in music: pitch and time factors, loudness, timbre, concurrent sounds, are all part of the musical whole; they can all be measured separately but for the musical experience a single specific term of measurement does not exist.

Evidence exists in speech and music research which recognizes the import of stress in creating rhythm groupings, the ease with which children can discriminate the amplitude factor, and the positive effect which the combination of rhythm and tone (as in speech rhythm patterns) could have on music learning. It would seem logical, then, to pursue an investigation of lingual teaching tools which offer a set of stress patterns that are undistorted in both speech and musical contexts.

The basis for such a system of stress pattern units has existed for centuries and resulted from the performance practices and correlation of Greek music and poetry. 105 The

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104 Ibid., p. 10.

105 Warren Anderson, "Word Accent and Melody in Ancient Greek Musical Texts," Journal of Music Theory, XVII (1973), 186-190; Bolton; Maury Alan Yeston, The Stratification of
six or seven patterns comprising the system are called poetic feet, and are determined by the accented syllable (-) and unaccented syllables (\(\_\)). These are iamb (\(\_\_\)), trochee (\(-\_\)), dactyl (\(-\_\_\_\)), anapest (\(\_\_\_\,-\)), amphibrach (\(\_\,-\)), and tremolo (\(\_\_\\_\)).\(^{106}\)

In 1960 Cooper and Meyer promoted the use of poetic feet as a device for musical perception and as a tool for music analysis.\(^{107}\)

The use of poetic feet to analyze rhythmic patterns is somewhat unusual. Rhythmic groupings have generally been treated as if they were metric units. However, since these groups can be found in various different meters they are not themselves the same as meters.\(^{108}\)

Examples of the Cooper and Myer analysis follow in Figure 3 with the brackets showing the architectonic interpretations possible.

\(^{106}\)Mursell, p. 177.  \(^{107}\)Cooper and Meyer.
\(^{108}\)ibid., p. 7.  \(^{109}\)ibid., p. 23.  \(^{110}\)ibid., p. 34.
Through their analytical system, Cooper and Meyer suggested the constancy of mini-structures (the poetic feet) for making the analysis, interpretation, and performance of notes a patterned, easily perceived operation. The described system was approached from the standpoint of music theory, and no suggestions or guidelines were made which offered educational application for young students.

In *Rhythm in Music*, Wedge used poetic feet in an attempt to improve performance of rhythm. The rationale for Wedge's approach was that poetry and music were inseparable from the beginning and that the fundamental principles of poetic meter and rhythm had to be preserved in music. By having the student recite a poem, taking care to observe the accentuation points and groups, this system intended to use language patterns as a technique leading to music learning. (See Figure 4.) No allowance was made for variation in the verse recitation. Further, the words were confined to the metric dimensions of the note-values rather than the note-values being given the dimensions of natural speech rhythm patterns.

Although the poetic feet system provides a set of figures which commonly may be recognized in music, performed

111 Cooper and Meyer.

Drill IV

Triple Meter, Beginning with the Third Pulse

I. (a) Recite the following lines while walking around the room, taking a step for each word and syllable:

Most friendship is feigning, most loving mere folly.  
A corpulent man is my bachelor chum.  
To market, to market, a gallop, a trot.  
A diller, a dollar, a ten o'clock scholar.  
There was an old woman who lived in a shoe.

(b) Beating time, recite the lines, repeating each line several times.
(c) Copy each line and draw a bar before each stressed syllable.
(d) Transcribe each line in note-values in 3/2, 3/4 and 3/8.
(e) Beating time, sing the words to the following pitches:

\[
\begin{array}{l}
\text{Fig. 4-Use of poetry for rhythm reading}\text{113}
\end{array}
\]

with the music, and notated in a variety of ways, a problem exists with the pattern labels. For example, dactyl is a two-syllable word (Xx) which represents a three-syllable figure (Xxx). To be a means for accurately performing a sound pattern (as clapping is in the kinesthetic mode), the lingual labels must have the same number of syllables and the same stress relationship as the patterns they are symbolizing.

An example of speech patterns which remain constant in their stress relationships and which are not limited to pitch or notational specifications can be seen in the techniques percussionists have used for teaching and reading the rudiments. The speech patterns perform the rhythm. (Ex:  

\[
\begin{array}{l}
\text{DoubleParadiddle}
\end{array}
\]

\[\text{113 Ibid., p. 14.}\]
The nonsensical words spoken retain the sound pattern to be performed, but, like the poetic feet, the representative notation may and does vary.

In summary, it appears that speech rhythm patterns can provide a viable teaching tool for music literacy as the intermediary steps between speaking and writing sound patterns. An instructional system which makes extensive use of speech rhythm patterns as a technique for symbolizing perceived musical sound is Education Through Music by Mary Helen Richards. (See Appendix A.)

Dissatisfied with the results of using the traditional metric organization of musical notation for helping hearing-impaired children speak, Richards and Allen developed a system of speech rhythm patterns which focused on the primary accent or stress within a group of sounds. These

114 Thirteen Essential Rudiments (Chicago).

115 Mary Helen Richards, Aesthetic Foundations for Thinking--Part One (Portola Valley, California, 1977); Mary Helen Richards, Aesthetic Foundations for Thinking--Part Two (Portola Valley, California, 1978); Mary Helen Richards, Aesthetic Foundations for Thinking--Part Three (Portola Valley, California, 1978).

116 Richards; Mariam Allen, Dance of Language (Portola Valley, California, 1974).
stress pattern units are small groups of generally one to four syllables each and emphasize intensity and pitch, but not duration. The pitch inflection comes as a contingent of intensity, rather than being a particularly separate area of focus. The speech rhythm patterns give students a set of groupings onto which they can situate new words or groups of words with the correct intonation pattern.

Typically, song is the context in which names and other familiar words are highlighted for work with the speech rhythm patterns. The nature of the song's specific tonal and rhythmic relationships provides a clarification and a constancy of the speech rhythm pattern which may not be so obvious in regular verbalization. For this reason, song materials are carefully selected for their appropriate carriage and non-distortion of the English language.

Speech rhythm patterns are introduced, practiced, explored, and read with a variety of sensory symbols. Ways of responding to and expressing the stress patterns of speech and song utilize a multi-sensory approach. Multi-sensory teaching strategies have been recommended by authorities in general education, but no studies exist which investigate the influence of this approach in music learning.\textsuperscript{117}

Multi-Sensory Approach

Working from the premise that "the more senses involved, the better chance for learning," teachers are frequently encouraged to have children moving, reciting, and reading graphics in order to enhance their music lessons.

Piaget and others have demonstrated that the learning and thinking of young children are linked to the concrete, the seeable, and the touchable. There is hardly a better way to present a concrete representation of an abstract idea than through visual and tactile experience that is reinforced and coordinated with the auditory and the kinesthetic.118

Miller offered a reasoning for multi-sensory stimulation of learning processes by explaining information theory.119 With channel capacity being the greatest amount of information that a subject can give about the presented stimulus on the basis of absolute judgment, Miller explained that more information bits give a greater chance of learner capacity. In this way, a multi-dimensional or multi-sensory approach would increase a person's learning capacity for certain stimuli by presenting more bits by which to make judgments. Early theorists disagreed on which sense did and did not constitute a music experience, and in particular, a rhythmic experience. Pillsbury regarded rhythm as encompassing the auditory, kinesthetic, tactual, and visual fields of


119 Miller.
sensation. Myers considered it only auditory, kinesthetic, and tactual; and Ebbinghaus limited rhythm to the auditory and kinesthetic modes. Kulpe recognized rhythm as purely aural, and Titchener cited the kinesthetic field as the only source of rhythmic sensation. McDougall argued that any element added to the pureness of a drum tap would weaken and impair its effectiveness. Perhaps McDougall's statement indicated that there is a point at which sensory stimulation no longer serves the learner or the music. Examination of this possibility seems warranted for the instructional bases of music duration.

Among children, as among all people, there are individual differences; some learn more easily through seeing, others through hearing, and still others through touch and movement. These differences should be met by a multiple sensory approach that will increase chances for successful teaching.

Although Mark's statement championing a multi-sensory approach seems reasonable, it has no supportive evidence in music research. Several questions could be raised which lead to the investigation of how a multi-sensory approach influences music learning; which sense may be the most effective

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123 McDougall, p. 476.

124 Mark, p. 129.
for music learning; whether there is a point at which the use of a sense mode for symbolizing sound becomes inefficient in music learning; and whether each sense serves a different function in music learning. One way of investigating some of these questions is to observe the responses of children as they are presented with and, in turn, demonstrate the kinesthetic, visual, and lingual modes of sound symbolization.

The technique of speech rhythm patterns lends itself to multi-sensory presentation and demonstration of musical sound, and has possibilities as a valuable tool for music perception and performance. Therefore, speech rhythm patterns seem to be a worthy means for investigating children's multi-sensory responses to musical sound.

Summary

Review of pertinent literature has offered insights into the connection of speech and music sound patterns. The subject of sensory teaching tools in music learning has many yet unanswered questions, particularly with regard to using a multi-sensory approach. Brief synopses are included here in summary of the literature on sensory involvement in music learning and speech rhythm patterns as a means for perceiving and symbolizing musical sound.

1. Traditional music notation presents a number of obstacles to children's music literacy. Therefore, techniques are needed which simplify musical sound symbols and
provide efficient ways for children to demonstrate their musical perceptions. Kinesthetic, visual, and lingual modes provide concrete means for this demonstration.

2. Studies showed no influence of visual teaching tools on music learning. However, the research was not conducted with children, no student-suggested visual symbols were explored, and the visual aids were not used as tools for music reading.

3. Kinesthetic teaching tools were found to have significant influence on the music learning of fourth grade and junior high students. Studies found movement, however, to be an activity which has questionable suitability for young children as a means for demonstrating musical perceptions.

4. The lingual mode as a teaching tool for music literacy has not been empirically researched. Studies investigating a broad range of children's abilities found that vocal responses of familiar word patterns were the most accurate means of reproducing a given musical rhythm pattern. There is a need for further research on the lingual mode as a means for symbolizing musical sound.

5. Fardig's research reported that the consequences of concentration on and over-emphasis of one particular technique or sense mode may be lack of student interest and impedance of learning. This conclusion would imply a need for a variety of engaging activities for student participation and spontaneity in investigative research.
6. The rhythmic sound patterns created by pitch, intensity, and duration are common to both speech and music. Speech, and historically the poetic foot, is made up of small units of generally one to four sounds grouped around a prominent, stressed syllable.

7. Stress is perhaps the most significant determiner of speech and music rhythm patterns. Speech and music research indicates stress is also perhaps the most easily perceived aspect of sound patterns.

8. Speech rhythm patterns, the rhythmic unit grouping of stressed and unstressed sounds, have been applied to rhythm reading and music analysis, but not to music instruction as ways for children to perceive and demonstrate sound patterns.

9. Speech rhythm patterns as a technique most often studied within a song context combines the elements of rhythm and tone. Research tends to support this combination for most accurate musical response.

10. Intonation grouping, such as that created by speech and music patterns, may be at the very base of information processing, retention, and recall. Research supports an approach to learning which employs patterning as a means for organization. Speech rhythm patterns could provide this means in music instruction.

11. The visual, kinesthetic, and lingual sense modes provide categories of teaching tools which make sound concrete
for children. Although the combination of these sense modes is a common procedure in music classes, no research is available which investigated the multi-sensory approach to music instruction.

12. The instructional system Education Through Music applies speech rhythm patterns in music instruction for children; it uses multi-sensory teaching tools for practicing the technique; and it aims the multi-sensory sound symbols to music reading experiences. Research is needed which (a) examines children's responses in symbolizing musical sound through kinesthetic, visual, and lingual teaching tools, and (b) compares the accuracy, frequency, and functions with which the senses are used.
CHAPTER III

METHODOLOGY

The purpose of this study was to investigate multi-sensory responses of children to symbolizing musical sound through speech rhythm patterns. The problems were (1) to determine children's responses to speech rhythm patterns according to the differential sensory modes used; (2) to determine children's responses to speech rhythm patterns by age, and (3) to compare children's responses to speech rhythm patterns by age and sensory modes.

In order to test the feasibility of the study and to develop an appropriate evaluation form for carrying out the research problems, a pilot study was conducted at a private school in Dallas, Texas, in May, 1980.

Pilot Study

Six students from grade two were selected by the principal and classroom teacher to participate in the pilot study. No specifications about ability, behavior, or training were requested by the researcher. Three girls and three boys ranging in age from 7 years 8 months to 8 years 10 months met each day for five days for the music sessions.

Each of the five forty-five-minute lessons taught by the researcher was structured to be progressive in its
presentation of speech rhythm patterns and modal symbolization by means of singing games. (See Appendix C.)

The chosen patterns were introduced and practiced through varied repetitions. The children were asked to move to their names, find other words which had the same pattern as their names and draw a symbol for the sound pattern of their names. The teaching techniques were taken from Education Through Music and are described in their general context in Appendix A.

In addition to comparing similarities and differences of the stress patterns with the names of students in the group, four additional patterns were selected for identification and sensory symbolization—SEVenty; eLEVen; twenty-ONE; twenty-SEVen. (See Appendix B.) For example, the song, "Oh, Here We Are Together" was used as a beginning name game and later for focus on the word "together" (eLEVen). Symbolization activities included moving to, finding another word for, and making a graphic for the sound pattern of the word. The "check" for each idea was to sing the song and see if the chosen movement, word, or visual pattern fit into the song the same way as did "together."

In order to measure the ease with which children developed their own sensory symbols or accepted those of the teacher, the teacher's responses in visual, kinesthetic, and lingual symbolization were always the same. The teacher's kinesthetic responses were CLAP-fist movements; lingual
responses were "number" words; and visual responses were the neumes (■,□). (See Appendix B.)

No attempt was made to get an equal number of responses from each student nor was any student required to contribute any particular response. Emphasis was placed more on spontaneous, uninhibited responses of the students rather than on "standardizing" or channeling their responses into any set form.

During the sessions, an observer attempted to record each sensory response of each child to the speech rhythm patterns. Each lesson was audio-cassette recorded to provide a review of the session for the researcher to discuss responses and proper coding with the observer, who was a senior music education major at North Texas State University. The researcher trained the observer prior to the pilot project in recognizing the speech rhythm patterns that were presented in the lessons and the categories of sense responses for the children.

An observation form was developed that allowed the observer to record tallies of the types and frequencies of each child's visual, kinesthetic, and lingual responses to the speech rhythm patterns. (See Appendix D.) Category definitions were determined prior to the observation which delineated the response classifications.

The category of visual response denoted a graphic drawing of a symbol which, according to the child, represented a
speech rhythm pattern. Kinesthetic response was specified as any movement intentionally made to represent a given speech rhythm pattern. An aural response designated the recognition of a speech rhythm pattern without the child's symbolizing it. The aural category was intended to allow for responses in which the child might say "there it is" when asked to find a given pattern within an unfamiliar song context. The lingual category was broken into sub-categories of "numbers," "nonsense," "name," and "other." These sub-categories were an attempt to classify the means by which the students verbally identified a recognized pattern. Student responses were classified as (a) "numbers" if a number (Seventy) was used; (b) "nonsense" if nonsense words or syllables were used, (c) "name" if a person's name was used; and (d) "other" if familiar words were used to symbolize a speech rhythm pattern.

Further divisions into "R" (representative) and "NR" (non-representative) were provided for each sense category in order to record the accuracy with which students responded. Correct responses were coded as "R," incorrect as "NR."

For the last session with the children, six examples were prepared which set the speech rhythm patterns which were studied during the week to simple melodic rhythms. Each item was played on resonator bells, repeated twice and presented to the students by a tape recording.
Item 1 "from the zoo"

Item 2 "Clickety"

Item 3 "together"

Item 4 "together"

Item 5 "from the zoo"

Item 6 "Punchinella, together, together, from the zoo"

Fig. 6--Score for Pilot Study Tape
The children were instructed to listen to each melody and decide which of the patterns written on the board they heard best in each item. The words with which each pattern was originally presented in a song appeared on the blackboard. (A. Punchinella, B. From the zoo, C. Clickety, D. Together.)

Results of the Pilot Study

The brevity of the study caused the researcher to choose only four speech rhythm patterns for specific identification, although others were recognized incidentally as part of the lessons. The limited time span also required much more focus on one area (speech rhythm patterns) than would be probable in a regular music classroom setting. Therefore, the students had a certain amount of predictability in their listening and knew that most responses called for the identification of a speech rhythm pattern. The main study would need to avoid the pressure of not being able to deviate from the materials specifically intended for the study investigation.

Teacher-suggested sensory symbols were tried but not always preferred by the students. Especially in the visual representation of sound, the neumes were seldom used, and the students' explanations of their symbols often showed more understanding of the constituents of the sound pattern than did the symbol itself. This indicated to the researcher that the teacher-suggested symbols were not always immediately understood and utilized by the students, and, therefore, were
not necessarily desirable instruments for the students' demonstrations of their musical perceptions.

Due to a misunderstanding in the first exposure of the clap-fist hand motions (Appendix B), these were seldom used appropriately as a kinesthetic symbol that showed the stressed and unstressed sounds. The lingual label most used by the students were the words of the song in which the pattern was first discovered. Although the students' names were also frequently used to identify a pattern, the song context seemed to provide a structure for examining the pattern which worked well for the students. Nonsense syllables were seldom used. The limited time of the study did not provide a setting for investigating the efficiency with which children use the number and month labels for speech rhythm patterns. (See Appendix B.)

In addition to symbolizing sound through speech rhythm patterns either correctly or incorrectly, it was found that students would distort a familiar word in order to make it fit a pattern:

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Student Word</th>
<th>Distorted Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PunchiNELLa</td>
<td>library</td>
<td>li-a-BRAR-y</td>
</tr>
</tbody>
</table>

Although this response was not altogether accurate discrimination, it did reflect an understanding of the sound pattern structure. It was determined by the researcher that this type of response could not be ignored in light of the progression of understanding speech patterns. Allowance should
be made for categorizing this type of response for the main study.

Direct observation was found to be unsatisfactory as a procedure for recording student responses. The observer and the researcher agreed that the problems of tallying responses for each child when several children frequently responded simultaneously needed solutions; and, as an aid for reviewing the lesson, the audio recordings were lacking in the ability to record the kinesthetic and visual response modes of the students. Thus, valuable information in the investigation of sensory responses to symbolizing sound was lost in the simplicity of reporting them in tally form and through direct observation. It became obvious to the researcher that the analysis of video-tapes of all lessons would yield more detailed and valid results.

Student responses to the exercise with instrumental music were influenced by the limited number of preparatory lessons; the brevity of instruction time for the exercise; the unfamiliarity with the activity and answering procedure; and the anxiety communicated when the students interpreted the exercise as a test. The students' responses were averaged and 48 percent of the answers were correct. Two students were correct on six of the nine answers on the exercise (67 percent). Activities intending to investigate whether or not the children heard speech rhythm patterns in purely
instrumental music seemed a valid and worthwhile outgrowth of work with this technique.

As a result of the pilot study, the following procedures were decided upon for the main study:

1. Sufficient time had to be allotted in the lessons for activities peripheral to the research purpose in order to keep the interest and motivation of the students.

2. Singing games seemed to provide a desirable setting for the students and teacher in working with speech rhythm patterns. Therefore, the song-games and teaching strategies for speech rhythm patterns published in Education Through Music texts were considered a viable resource for the main study.¹

3. Video-tape recordings of each lesson would have to be used to offer more efficient interpretation and coding of student responses.

4. Because the nature of the study required spontaneous, overt, oral responses, the size of the groups would have to be limited to six children. This size was also considered compatible with a stationary camera setting for video-taping all activities.

5. Three different age levels of children would be needed to provide comparative data for analyzing sensory responses.

¹Mary Helen Richards, Aesthetic Foundations for Thinking—Part One (Portola Valley, California, 1977).
Therefore, five-, seven-, and nine-year-old children would be requested for observation. These age levels would be in line with research findings that indicated a leveling-off in growth every two years. Differences in learning patterns were expected for these ages and groups of children.

6. A revised observation form was needed. The aural category could be deleted; allowance would have to be made for teacher- and child-suggested classification of each response; and three levels of accuracy needed to be provided for accurate, somewhat accurate, and inaccurate responses.

7. Two observers would have to be used for coding the student responses. As a result of discussions with the pilot study observer, the researcher determined that student responses could most easily be interpreted and coded when accompanied by the knowledge of the classroom setting and the children's individual behaviors. In the main study, therefore, the researcher would serve as one of the two observers.

All results supported this researcher's notion that it was feasible and viable to observe in detail and systematically the sensory responses of children to symbolizing musical sound through speech rhythm patterns.

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Main Study

Over a period of four weeks, six students each of ages five, seven, and nine received daily thirty minute lessons that dealt with work on speech rhythm patterns. Of the eighteen children participating in the study, there were three boys and three girls in each of the three groups. The mean age was five years four months (five-year-olds); six years nine months (seven-year-olds); and eight years nine months (nine-year-olds) for each group.

Selection of students to participate in the study followed three steps. First, the writer explained the study and the time frame to the cooperating principals at a private school in Dallas, Texas. With the administrators' approval, a letter was written and distributed to parents of all five-year-olds, first grade and third grade students to ask permission for their child to participate in the project. The school principals then screened the returned permission slips and selected six students from each age group to participate in the month-long study.

No special requests were made by the researcher regarding the achievement, social, or academic standing of the children. No attempt was made during the study to determine on what basis the children had been chosen. After the study was completed, the principals were questioned as to why the particular students had been selected. Both principals
stated their selection stemmed from personal reasons unrelated to academic or musical accomplishments.

Daily lessons consisted of song-experience-games similar to those of the pilot study. (See Appendix C.) They were planned for the active participation and enjoyment of the students, and focused on introduction, practice, and exploration of the speech rhythm pattern symbolizations. Through the song-games, students offered movement, visual, and lingual ideas for symbolizing speech rhythm patterns. The researcher taught all lessons, and each lesson was video-taped.

A log book of lesson plans and symbolization tasks was kept by the researcher throughout the study. For the sake of student interest and lesson variety, not all activities dealt with exploring speech rhythm patterns; rather, an average of approximately seventeen to twenty-five minutes of the thirty-minute lessons were focused on this technique. Although planned into the lesson and video-taped to avoid disruption of the flow of activities, the remainder of activities were not intended to directly contribute to the purpose of this study.

The nature of the activities presented to the three age groups over all lessons included a variety of thirty different sensory tasks. (See Table I.) The tasks were presented to the students in various song-game activities and
## TABLE I

**SENSORY TASKS**

<table>
<thead>
<tr>
<th>Requested Response</th>
<th>Presentation Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kinesthetic Tasks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$K_{ns}$</td>
<td>$L_s$</td>
<td>Clap or make a motion for the syllable pattern of a given word.</td>
</tr>
<tr>
<td>$K_{ns}$</td>
<td>$L_{ns}L_s$</td>
<td>Clap or make a motion for the syllable pattern of a given word accompanied by movement.</td>
</tr>
<tr>
<td>$K_{ns}$</td>
<td>$A_l$</td>
<td>Clap or make a motion for a selected pattern in non-lingual (instrumental) music.</td>
</tr>
<tr>
<td>$K_s$</td>
<td>$V_{sp}$</td>
<td>Clap or make a motion for the stress pattern of a prepared visual symbol.</td>
</tr>
<tr>
<td>$K_s$</td>
<td>$K_sL_s$</td>
<td>Clap or make a motion for the stress pattern of a given word accompanied by stressed movement.</td>
</tr>
<tr>
<td>$K_s$</td>
<td>$K_sV_{sp}$</td>
<td>Clap or make a motion for the stress pattern of a prepared visual symbol and stressed movement.</td>
</tr>
<tr>
<td>$K_s$</td>
<td>$V_{sp}L_s$</td>
<td>Clap or make a motion for the stress pattern of a prepared visual symbol and a representative word.</td>
</tr>
<tr>
<td>$K_sV_{sp}$</td>
<td>$L_s$</td>
<td>Clap or point to the stress pattern and identify the prepared visual symbol for a given word.</td>
</tr>
<tr>
<td>$K_sL_s$</td>
<td>$V_{sp}$</td>
<td>Clap or make a motion for the stress pattern of a word chosen to match a given prepared visual symbol.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Visual Tasks</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{ns}$</td>
<td>$L_s$</td>
<td>Draw a symbol to represent the syllable pattern of a given word.</td>
</tr>
<tr>
<td>$V_s$</td>
<td>$L_s$</td>
<td>Draw a symbol to represent the stress pattern of a given word.</td>
</tr>
<tr>
<td>$V_{ns}$</td>
<td>$K_sL_s$</td>
<td>Draw a symbol to represent the syllable pattern of a given word accompanied by movement.</td>
</tr>
<tr>
<td>Requested Response</td>
<td>Presentation Mode</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>$V_s$</td>
<td>$A_i$</td>
<td>Draw a symbol to represent the stress pattern of a non-lingual (instrumental) musical selection.</td>
</tr>
<tr>
<td>$V_s$</td>
<td>$L_sK_s$</td>
<td>Draw a symbol to represent the stress pattern of a given word and accompanying stressed movement.</td>
</tr>
<tr>
<td>$V_{sp}$</td>
<td>$L_s$</td>
<td>Identify a prepared visual stress pattern symbol which fits a given word.</td>
</tr>
<tr>
<td>$V_{sp}$</td>
<td>$K_sL_s$</td>
<td>Identify a prepared visual stress pattern symbol which fits the stress pattern of a given word and accompanying stressed movement.</td>
</tr>
<tr>
<td>$V_{sp}$</td>
<td>$A_i$</td>
<td>Identify a prepared visual stress pattern symbol which fits the stress pattern of a non-lingual (instrumental) musical selection.</td>
</tr>
</tbody>
</table>

**Lingual Tasks**

<table>
<thead>
<tr>
<th>Requested Response</th>
<th>Presentation Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_s$</td>
<td>$K_s$</td>
<td>Say a word which fits a given movement stress pattern.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$V_{sp}$</td>
<td>Say a word which fits a prepared visual symbol.</td>
</tr>
<tr>
<td>$L_{ns}$</td>
<td>$L_s$</td>
<td>Say a word which fits the syllable pattern of a given word.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$L_s$</td>
<td>Say a word whose stress pattern fits the stress pattern of a given word.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$K_sL_s$</td>
<td>Say a word which fits the stress pattern of a given word accompanied by stressed movement.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$V_{sp}$</td>
<td>Say a word whose stress pattern fits a given visual symbol.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$K_sL_s$</td>
<td>Say a word whose stress pattern fits the stress pattern of a given word accompanied by a stressed movement.</td>
</tr>
<tr>
<td>$L_s$</td>
<td>$V_{sp}K_s$</td>
<td>Say a word whose stress pattern fits the stress pattern of a given visual symbol accompanied by a stressed movement.</td>
</tr>
</tbody>
</table>
TABLE I--Continued

<table>
<thead>
<tr>
<th>Requested</th>
<th>Presentation Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ls</td>
<td>VspLs</td>
<td>Say a word whose stress pattern fits the stress pattern of a given visual symbol accompanied by a representative word.</td>
</tr>
<tr>
<td>Ls</td>
<td>Ai</td>
<td>Say a word whose stress pattern fits the selected stress pattern of a non-lingual (instrumental) musical selection.</td>
</tr>
</tbody>
</table>

Reading Tasks

| KsVspLs   | VspLs             | Say/sing a word and follow the prepared visual symbol for a given word. |
| KsVspLs   | Vsp               | Say/sing a word and follow a prepared visual symbol. |
| KsVspLs   | As                | Say/sing a word and follow a prepared visual symbol while the song in which the word occurs is being sung. |

provided for a variety of multi-sensory responses to speech rhythm patterns. Category definitions for the various tasks appear in Figure 7.

Kns = kinesthetic nonstress
Ks  = kinesthetic stress
Vns = visual nonstress
Vs  = visual stress
Vsp = visual stress, prepared symbol (neumes)
Lns = lingual nonstress
Ls  = lingual stress
As  = aural song
Ai  = aural instrumental
R   = multi sensory/reading

Fig. 7--Key for Abbreviations
In line with the researcher's intent to observe "what the children can do" rather than "what they can be taught to do," the role of the teacher was not as much instructional as catalytic. Guided instruction occurred to familiarize the students with the technique of speech rhythm patterns and to monitor incorrect answers.

Each lesson was held in the library of the school with a Sony one-half-inch cassette VHS player available for the video-taping. No mention was made to the students about the video-tape machine. Although some noticed it, the presence of the camera had no apparent effect on the students' behavior and responses.

The seven- and nine-year-old students had been offered bi-weekly music classes in the school curriculum from the time they were five years old. Therefore, it must be recognized that some prior training in symbolizing musical sound may have existed for these two age groups, while the five-year-olds were just beginning their school music education.

**Procedure for Observation and Collection of Data**

Two formats were used in collecting the data for the study. The first was a quantitative analysis of children's responses, and the second was a qualitative interpretation. The two approaches will be discussed in that order.
Quantitative analysis.—The video tapes of the lessons were viewed many times prior to the actual assessment in order to determine which activities were points for focus and evaluation. The log book of lesson plans maintained throughout the study also became the record of video-tapes and lesson segments for evaluation.

The two observers assessing and coding students' responses proceeded with the following sequence:

1. Identify and label task by presentation mode and requested response mode

2. Identify and code sense mode of response
   a. kinesthetic
   b. visual
   c. lingual
   (1) names
      (2) numbers
      (3) nonsense
      (4) familiar words

3. Identify and code accuracy of response
   a. category 1—accurate
   b. category 2—somewhat accurate
   c. category 3—inaccurate

4. Identify and code initiation of response
   a. child-suggested
   b. teacher-suggested

Fig. 8—Sequence for Evaluating Responses

The criteria for assessing the responses and following the observation sequence appear in Figure 9.
1. Task Identification—label the presentation mode and the requested response sense mode (K,V,L). Further specify task by the sub-characters indicating stress or nonstress, song or instrumental.

2. Sense Mode Identification
   a. Kinesthetic—responses which involved movement such as clapping, stamping, etc. intended specifically to represent a speech rhythm pattern.
   b. Visual—responses which involved drawing, selecting or reading a graphic symbol intended to represent a speech rhythm pattern.

3. Accuracy Identification
   a. Category 1—responses which had the correct number of syllables and the correct stress (if the stress pattern was requested) to match a given pattern.
   b. Category 2—responses which had the correct number of syllables, but incorrect stress pattern. And, in the case of the lingual mode, responses which distorted a familiar word in order to have it accurately match a given pattern.
   c. Category 3—responses which had the incorrect number of syllables for matching a given pattern.

4. Initiation Identification
   a. Child-suggested—responses made by the children which were not in imitation of or suggested by the teacher.
   b. Teacher-suggested—responses which were presented to the students by the teacher.

Fig. 9--Criteria for Assessing Responses
The revised Student Response Assessment Form (Appendix E) was used by the observers to code the responses for each lesson according to the task label. A separate form was used for each task designation. Therefore, each form for the study was identified by the task description, grade level, lesson number, and date of the session.

Each child's responses which were intended to represent a speech rhythm pattern were coded. Because the nature of the speech rhythm pattern technique is based upon the use of speech, speech accompanied nearly every visual and kinesthetic response. Therefore, it was necessary to code only lingual responses which were intended to match, not merely repeat, a given pattern. Lingual responses which occurred as part of the song or in imitation of a word to be represented kinesthetically, visually, or lingually were not coded.

It was impossible in the setting of this study for the observers to determine how often a child actually said the word in connection with the speech rhythm pattern. Also, inner-hearing or audiation of a word as a valid and useful tool could not be overlooked as a covert lingual response. Because this learning strategy (inner-hearing) is not overt and observable, however, the raters found it necessary to limit the coding of all lingual responses to only those which were intended to match a given word pattern.

Double responses did occur, were treated as separate responses to the same task, and were double-coded. For
example, the presentation mode may have been lingual stress ($L_s$) and the response requested was $L_s$. This task required matching a given word with a word having a similar stress pattern. Occasionally, the students accompanied their lingual response or examined the given word by using a kinesthetic tool. Those kinesthetic responses were coded in addition to the lingual response on the same task form. From this approach of double-coding, it was possible to determine to what extent one sense mode was used as a tool for responding in another mode.

Other tasks which required double- and triple-coding were those related specifically to reading a prepared visual name symbol. (See Appendix B.) Reading was defined as a multi-sensory experience in this study because it required the use of visual neumes as the guide, tapping the squares of the name, and saying or singing the speech rhythm pattern. The observers found it impossible to tell which sense if any was the motivating force for coordinating all three into reading. Therefore, the reading activities were treated as multi-sensory responses and coded as such; a tally was coded in each sense with which the children read the symbol (usually all three senses).

If a child correctly identified and followed a neume by touching and saying or singing the pattern, he or she was given a tally in Category 1 for each the kinesthetic stress, visual prepared symbol, and lingual stress modes as
teacher-suggested responses. If a child was correct in identifying the neume and saying the word, but incorrect at following kinesthetically, this response was coded as: visual prepared symbol—Category 1 (accurate); lingual stress—Category 1 (accurate); and kinesthetic stress—Category 3 (inaccurate).

Every attempt was made by the two observers to record each response of each child according to the preceding sets of guidelines. In order to verify the consistency with which the two observers followed these guidelines, observer stability was established. Three weeks after the coding of all video-taped lessons, ten randomly chosen lessons were analyzed a second time in order to determine rater stability. The Scott coefficient of consistency indicated "good agreement" (.79) between the two sets of assessments.

Qualitative Analysis.—A qualitative interpretation of the data was found to be a valid and needed part of the total investigation because some student responses could not be properly assessed by the Student Response Assessment Form alone. The qualitative report was gathered from transcripts of the video-tapes. The kinesthetic, visual, and verbal interactions among the students and between the students and the teacher were recorded in script form to report key segments of the study for interpretation and discussion.
Lingual responses were transcribed verbatim, while kinesthetic responses were represented in order to denote the stress pattern and type of movement with which the response was made. The visual responses were reproduced along with the tests of the students' accompanying explanations.

**Treatment of the Data**

The quantitative compilation of the study results was collected from the Student Response Assessment Forms. Responses for the study were totaled within categories of age, child, sense mode, task, accuracy, and initiation (teacher- or child-suggested responses). Percentage distributions were then computed for the following classifications:

I. Total Responses of All Children in Percent
   A. Sense Mode
   B. Task
   C. Accuracy
   D. Initiation

II. Sense Mode Responses of All Children in Percent
   A. Task
   B. Accuracy
   C. Initiation

III. Age Responses of All Children in Percent
   A. Sense Mode
   B. Task
   C. Accuracy
   D. Accuracy and Sense Mode
   E. Initiation
   F. Initiation and Sense Mode

IV. Task Responses of All Children in Percent
   A. Accuracy
   B. Accuracy and Age
   C. Initiation
   D. Initiation and Age

Fig. 10—Percentage Classifications of All Children
Results were also compiled for reporting profiles for each child according to the following classifications.

I. Total Responses per Child in Percent
   A. Sense Mode
   B. Task
   C. Accuracy
   D. Initiation

II. Sense Mode Responses per Child in Percent
   A. Task
   B. Accuracy
   C. Initiation

III. Task Responses per Child in Percent
   A. Accuracy
   B. Initiation

Fig. 11—Percentage Classifications Per Child

In addition to the preceding guidelines for calculating and reporting student responses, three further analyses were conducted. First, a percentage comparison was made between the frequency with which students responded in a particular sense mode and the frequency with which that same sense mode was requested through the task. These percentages were computed by dividing the number of observed responses in each sense by the total number of observed responses. Likewise, the number of responses requested in each sense was divided by the total number of responses requested through the tasks. By reporting these comparisons of observed and requested responses by age and sense mode, the researcher intended to evidence the extent to which students used various suggested sense modes as learning tools.
Secondly, the researcher was interested in finding to what extent a sense mode was used as a tool for solving a problem in another mode. These results were determined by compiling the mode, frequency, and accuracy of responses which were offered by the children in a sense mode other than the one requested through the task. Also, the frequency with which the teacher used a particular sense mode as a task presentation mode was determined. Reporting comparative frequencies in task presentation modes could provide evidence of balanced or unbalanced sensory mode presentation in the study. The chi square formula for one sample was used to determine statistically significant differences between percentages in response categories.

In the qualitative interpretation of the data, each segment of the study selected for the transcript presentation was accompanied by a brief discussion and subjective analysis of student responses. By discussing the students' responses in the context of the lesson activities, the researcher intended to substantiate the quantitative results and point out the unique responses and response approaches of individual children.

By quantitatively and qualitatively analyzing children's multi-sensory responses to sound symbolization, profiles were offered which would provide insights into child learning. It was also hoped that objective and subjective comparisons between ages, children, sensory tasks, and accuracy would aid
in suggesting further research. This research would focus on the processes by which children of different ages approach the learning of sound symbolization and music reading.
CHAPTER IV

RESULTS OF THE STUDY

The purpose of this study was to investigate multi-sensory responses of children to symbolizing musical sound through speech rhythm patterns. The research problems were

1. to identify children's responses to speech rhythm patterns according to the differential sensory modes used,

2. to determine children's responses to speech rhythm patterns by age, and

3. to compare children's responses to speech rhythm patterns by age and sensory modes.

Both quantitative and qualitative analyses were conducted to investigate the research problems. First, the results of the quantitative analysis will be presented separately for all three groups and each individual child. Then follows the qualitative analysis as well as a summary of all results.

Quantitative Analysis

Group Analysis

For the quantitative analysis, all children's speech rhythm pattern responses, as observed and classified by the raters, were converted into percentages according to (1) the three age groups; (2) the frequency of presentation modes by
the teacher; (3) the frequency of requested response modes; (4) the frequency of observed response modes; (5) the accuracy level of all responses; (6) the accuracy of sense mode responses; and (7) the accuracy of responses to a particular task. All percentage comparisons were conducted by chi square computations for one sample in order to determine whether a statistically significant difference existed between the frequencies. Differences were compared between frequency percentages and accuracy percentages according to age, sense mode, and tasks. The critical value was set at the .05 level of significance.

In order to conduct a valid comparison of the nature of all responses, they were, first of all, analyzed in relationship to the frequency by which the teacher either presented a particular task or requested its use as a response. This information was then compared to the frequency of observed responses. Table II shows this relationship of presented, requested, and observed sense modes separately for the three age groups.

From the table one can see that, with regard to all age groups, the various modes differed significantly in the frequency by which each of them was presented, requested, and actually observed. When looking at the relationship of observed to presented and requested sense modes for each age,
<table>
<thead>
<tr>
<th>Sense Mode</th>
<th>Age 5 (N=6)</th>
<th>Age 7 (N=6)</th>
<th>Age 9 (N=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Presentation</td>
<td>Requested Response</td>
<td>Observed Response</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>36</td>
<td>36</td>
<td>52</td>
</tr>
<tr>
<td>Visual</td>
<td>14</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Lingual</td>
<td>83</td>
<td>37</td>
<td>17</td>
</tr>
<tr>
<td>Aural</td>
<td>4</td>
<td>..</td>
<td>..</td>
</tr>
<tr>
<td>Reading (KVL)</td>
<td>..</td>
<td>18</td>
<td>29</td>
</tr>
<tr>
<td>x²</td>
<td>108.17</td>
<td>22.80</td>
<td>53.52</td>
</tr>
</tbody>
</table>

p < .001
one finds that the five-year-olds did not differ in the frequency of their kinesthetic responses from those that were requested and presented. They differed significantly in their use of visual and lingual mode responses. The teacher presented and requested these modes (visual and lingual) significantly more frequently than the children made use of them.

In the case of the seven-year-olds, presented, requested, and observed modes differed significantly in the kinesthetic and lingual categories. The children offered significantly more kinesthetic responses than were either presented to or requested from them. They responded significantly fewer times in the lingual mode when compared to the frequency of lingual presentations and lingual response requests.

For the nine-year-olds, similar results were obtained as for the seven-year-olds. The differences between presented, requested, and observed modes were significant with regard to the kinesthetic and the lingual categories. Most frequently presented was the lingual mode, but the kinesthetic response was most frequently observed.

To summarize the results presented in Table II, the lingual mode was most often presented to and requested from all three age groups in the study. Kinesthetic responses were most frequently used by all ages. The five-year-olds were the only group which did not use the kinesthetic mode significantly more frequently than it was requested.
Table III further delineates the percentage difference between requested responses and observed responses according to age and task. Each task is classified within a sense mode by the stress or nonstress nature of the response. Non-stress tasks meant that the correct number of syllables for the pattern was accepted as an accurate response. In stress tasks emphasis was placed on performing or identifying the stress relationships of the pattern. Except for the visual prepared symbol task, all tasks represented the students' own symbolization of a pattern through a sense mode. In the visual prepared symbol task, the symbol (neumes) was prepared by the teacher (Appendix B) and the students were only asked to identify it, not make a symbol for the sound themselves.

It can be seen from Table III that kinesthetic and visual stress tasks were not requested from the five-year-olds. However, more kinesthetic nonstress and reading task responses were observed for them than had been requested. From the seven-year-olds, most requested responses were lingual stress tasks, however, most observed responses were in the kinesthetic nonstress category. Only the reading, kinesthetic nonstress, and kinesthetic stress tasks resulted in a higher frequency of observed than requested responses. For the nine-year-olds, the majority of requested as well as observed responses occurred in the lingual stress tasks. Only the kinesthetic nonstress, kinesthetic stress, visual stress,
<table>
<thead>
<tr>
<th>Sense Mode</th>
<th>Task</th>
<th>Age 5 (N=6)</th>
<th>Age 7 (N=6)</th>
<th>Age 9 (N=6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Requested Responses</td>
<td>Requested Responses</td>
<td>Requested Responses</td>
<td>Requested Responses</td>
</tr>
<tr>
<td></td>
<td>Observed Responses</td>
<td>Observed Responses</td>
<td>Observed Responses</td>
<td>Observed Responses</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>NonStress</td>
<td>36</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td>.</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Visual</td>
<td>NonStress</td>
<td>9</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td>.</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Prepared</td>
<td>.</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Lingual</td>
<td>NonStress</td>
<td>23</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Stress</td>
<td>14</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Reading (KVL)</td>
<td>18</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>
and reading tasks resulted in more observed than requested responses. Altogether, the nine-year-olds were requested to respond through a higher percentage of stress than nonstress tasks in all sense modes.

An overall comparison in requested and observed responses among ages found the kinesthetic mode to be more frequently observed than was requested. Lingual stress tasks were requested more frequently than any others for the seven- and nine-year-olds. The five-year-olds were requested to respond with stress tasks much less frequently than the seven- and nine-year-olds.

Some of the observed responses in each sense mode were offered as additional responses to those requested. For example, a lingual mode may have been requested, but students occasionally responded with a lingual and a kinesthetic symbolization. This phenomenon was double-coded in the lesson analysis in order to show to what extent one sense mode was used for solving a problem in another mode. Table IV reports the results of categorizing the observed responses reported in Table II into percentages of the primary mode (requested in the task) and secondary mode (offered in addition to the task response mode). Because the total of percents in primary and secondary modes equal 100 percent, only the secondary mode responses are reported.
TABLE IV

OBSERVED RESPONSES ACCORDING TO USE AS SECONDARY MODE IN PERCENT

<table>
<thead>
<tr>
<th>Sense Mode</th>
<th>Use as Secondary Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age 5</td>
</tr>
<tr>
<td>Kinesthetic</td>
<td>8</td>
</tr>
<tr>
<td>Visual</td>
<td>0</td>
</tr>
<tr>
<td>Lingual</td>
<td>1</td>
</tr>
</tbody>
</table>

For all ages, the percentage of sense responses used as a secondary mode was minimal, except for the seven-year-olds' use of the kinesthetic mode. Almost half of all kinesthetic responses by the seven-year-olds were made as a supplement to the requested response mode.

In each of the preceding tables frequency percentages were offered for analysis of sense modes used in the study. In addition to the frequency of sense responses, accuracy was a major point of focus in exploring multi-sensory responses to speech rhythm patterns. Students' frequency of sense mode responses (regardless of accuracy) and accuracy of responses (regardless of sense mode), are reported as percentages in Table V. Accuracy level classifies the responses as (1) accurate, (2) somewhat accurate, or (3) inaccurate.
TABLE V
SENSE MODE FREQUENCY AND ACCURACY LEVEL IN PERCENT
ACCORDING TO AGE

<table>
<thead>
<tr>
<th>Age</th>
<th>Sense Mode Frequency</th>
<th>Accuracy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>67</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td>x^2</td>
<td>2.84</td>
<td>1.47</td>
</tr>
<tr>
<td></td>
<td>p&lt;.3</td>
<td>p&lt;.5</td>
</tr>
</tbody>
</table>

The frequency with which each age group responded in the kinesthetic, visual, and lingual modes differed. Each age, however, responded with similar frequency within each sense mode. All three ages responded most frequently in the kinesthetic mode, least frequently in the visual mode.

Each age group was more accurate than inaccurate and differed according to age in the "somewhat accurate" and "inaccurate" categories. The five-year-olds were the most inaccurate group, and the nine-year-olds had more responses in Category 2 than the younger children. From the table, the seven-year-olds appear to be the most frequently accurate group.

To compare the accuracy with which each age responded to the sense modes and specific tasks, Table VI is presented.
<table>
<thead>
<tr>
<th>Age</th>
<th>Sense Mode Accuracy</th>
<th></th>
<th></th>
<th>Task Accuracy</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
<td>Lingual</td>
<td>23.84 x²</td>
<td>Ketnsthetic</td>
<td>Visual</td>
<td>Lingual</td>
<td>Ketnsthetic</td>
<td>Visual</td>
<td>Ketnsthetic</td>
<td>Visual</td>
</tr>
<tr>
<td>5</td>
<td>45</td>
<td>17</td>
<td>73</td>
<td>45</td>
<td>17</td>
<td>17</td>
<td>75</td>
<td>82</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>83</td>
<td>65</td>
<td>76</td>
<td>2.2 x² p&lt;.5</td>
<td>88</td>
<td>76</td>
<td>66</td>
<td>14</td>
<td>77</td>
<td>75</td>
<td>76</td>
</tr>
<tr>
<td>9</td>
<td>81</td>
<td>53</td>
<td>66</td>
<td>5.88 x² p&lt;.1</td>
<td>95</td>
<td>72</td>
<td>100</td>
<td>36</td>
<td>100</td>
<td>93</td>
<td>62</td>
</tr>
<tr>
<td>X²</td>
<td>13.12 p&lt;.01</td>
<td>16.73 p&lt;.001</td>
<td>.73</td>
<td>19.28 p&lt;.001</td>
<td>57.04 p&lt;.001</td>
<td>9.68 p&lt;.001</td>
<td>2.98 p&lt;.01</td>
<td>2.66 p&lt;.3</td>
<td>2.87 p&lt;.7</td>
<td>1.13 p&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>
Each percentage reflects only the accurate (Category 1) responses. Also reported are the significance of differences according to age, sense mode accuracy, and task accuracy.

Only the five-year-old group showed significant differences in accuracy among the sense modes; they were most frequently accurate in the lingual mode. The seven- and nine-year-olds were more frequently accurate in the kinesthetic than other sense modes. Significant differences in accuracy existed between ages in the kinesthetic mode and the visual mode. Only slight differences were found among the five-, seven-, and nine-year-olds' accuracy in the lingual mode. The seven-year-olds had the highest percentage of accurate responses in each sense mode category.

Each age group showed differences in the accuracy with which they performed specific tasks. The five- and seven-year-olds were most frequently accurate in the reading task, and the nine-year-olds showed the highest percentage of accuracy in the visual nonstress and visual prepared symbol tasks. Therefore, the two younger groups seemed to perform the multi-sensory responses of the reading task most accurately, while drawing the syllable pattern of a word and identifying a prepared stress pattern symbol were most frequently accurate tasks for the nine-year-olds.

The accuracy of the kinesthetic nonstress and visual nonstress tasks showed differences between the age groups. Although the nine-year-olds were only 36 percent accurate in
the visual stress task, the seven-year-olds were less frequently accurate in this same task. The three ages were most similar in their accuracy for the lingual nonstress, lingual stress, and reading tasks. Therefore, the lingual mode and the multi-sensory reading tasks showed less evidence of age differences according to the accuracy with which the children responded. Conversely, the kinesthetic nonstress and visual nonstress tasks showed obvious age level differences in accuracy of speech rhythm pattern symbolization.

Summary.--As a summary of the group analysis for multi-sensory responses in this study, the results will be condensed according to the seven points of focus listed at the beginning of this section (pp. 97-98). First, the lingual mode was most frequently presented to and requested from all three age groups. The kinesthetic mode was the most frequently used by each age, and the seven- and nine-year-olds responded in the kinesthetic mode more frequently than they were requested to do. Few stress tasks were requested from the five-year-olds, and these were in the lingual mode. Almost half of the seven-year-olds' observed kinesthetic responses were responses used as a tool for aiding another sense mode.

With regard to accuracy, each age was more frequently accurate than inaccurate in their responses. The seven- and nine-year-olds were not more frequently accurate in any one mode; however, the five-year-olds showed a significantly
higher percentage of accurate responses in the lingual mode. The multi-sensory reading task showed the highest percent of accurate responses for the five- and seven-year-olds, while the nine-year-olds were most frequently accurate in the visual nonstress and visual prepared tasks. The accuracy percentage between the three age groups was most similar in the lingual nonstress, lingual stress, and reading tasks, and least similar in the kinesthetic nonstress and visual nonstress tasks.

Analysis of Individual Children

In order to further investigate the results of the group analysis, individual profiles were compiled for each child according to (1) age group; (2) frequency of sense mode responses; (3) accuracy level of all responses; (4) accuracy of sense mode responses; and (5) accuracy of responses to a particular task. The following presentations of individual responses are intended to enhance and further explain the results of the group analysis.

For the five-year-old children, the frequency of sense mode responses and the accuracy level of all responses are presented in Table VII. As shown in this table each child responded most frequently in the kinesthetic mode. The children in the five-year-old group were alike in the frequency with which they responded in each mode. Accuracy levels
TABLE VII
SENSE MODE FREQUENCY AND ACCURACY LEVEL IN PERCENT
FOR FIVE-YEAR-OLDS (N=6)

<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Mode Frequency</th>
<th></th>
<th>Accuracy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
<td>Lingual</td>
</tr>
<tr>
<td>1</td>
<td>70</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>72</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>59</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>64</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td>52</td>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>$X^2$</td>
<td>5.24</td>
<td>2.75</td>
<td>6.97</td>
</tr>
<tr>
<td></td>
<td>p&lt;.1</td>
<td>p&lt;.3</td>
<td>p&lt;.3</td>
</tr>
</tbody>
</table>

differed significantly in each accuracy category. All but one student (Child 5) were more frequently accurate than inaccurate in responding.

Table VIII shows the sense mode accuracy and task accuracy for each of the five-year-old children. Only Category 1 responses (accurate) are reported in this table for each sense mode and task.

When used, the lingual response was most frequently accurate for each child. Also, the accuracy percentages in the lingual mode were similar among children. Therefore, the lingual mode reflected the most consistently accurate responses among the five-year-old children. Accuracy of the kinesthetic and the visual responses of individuals differed.
<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Accuracy</th>
<th>Task Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
</tr>
<tr>
<td>1</td>
<td>45</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>42</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>49</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>51</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>$X^2$</td>
<td>24.74</td>
<td>199.6</td>
</tr>
<tr>
<td></td>
<td>p&lt;.001</td>
<td>p&lt;.001</td>
</tr>
</tbody>
</table>
Each of the children had similar accuracy levels in the kinesthetic mode, except for Child 5 who was accurate only 13 percent of the time.

Each of the five-year-old children showed noticeable differences in the accuracy with which they performed various tasks. They were not alike as a group in their task accuracy (except for lingual nonstress). Four children were most frequently accurate in the reading task, and two were most frequently accurate in the lingual nonstress task. Only two children offered correct responses in the visual nonstress task. Except for the visual nonstress, kinesthetic nonstress tasks were the most difficult for the five-year-old children to perform accurately.

Relating the individual response results to the group results for the five-year-olds, the children were consistent in using the kinesthetic more than any other mode. Only Child 5 was an exception to the group report of more frequently accurate than inaccurate responses. However, the children were not alike in the percentages of responses in accurate, somewhat accurate, and inaccurate categories.

The group report of the lingual mode being the most frequently accurate is true for each five-year-old child. The significant differences in accuracy percentage in the visual nonstress task among the three age groups is evidenced in the fact that only two children of the five-year-olds offered an accurate response. All but one child
(Child 5) had a high percentage of accurate responses in the reading task, and this child seemed to have affected the accuracy similarity among children for this task. With regard to task accuracy, the five-year-olds were dissimilar in each task except the lingual nonstress activities. The lingual sense mode and tasks offer the only similarity in accuracy percentages for the individual five-year-old children; therefore, the reported group profile frequently did not account for many dissimilarities among the individual children.

Table IX presents the sense mode frequency and accuracy level of the seven-year-old children.

**TABLE IX**

SENSE MODE FREQUENCY AND ACCURACY LEVEL IN PERCENT FOR SEVEN-YEAR-OLDS (N=6)

<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Mode Frequency</th>
<th>Accuracy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
</tr>
<tr>
<td>1</td>
<td>66</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>68</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>63</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>66</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>69</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>X^2</th>
<th>p&lt;.99</th>
<th>p&lt;.99</th>
<th>p&lt;.98</th>
<th>p&lt;.7</th>
<th>p&lt;.2</th>
<th>p&lt;.01</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table IX presents the sense mode frequency and accuracy level of the seven-year-old children.
The kinesthetic mode was the most frequent mode of response for each child. The children were alike in their proportionate frequencies of sense mode responses. Although all children in the seven-year-old group offered accurate responses more frequently than inaccurate responses, the frequency of inaccurate responses was significantly different from child to child.

Percentages of sense mode accuracy and task accuracy for the seven-year-olds are reported in Table X. As one can see from this table, the visual mode showed significant differences from child to child, and the kinesthetic responses were the most consistently accurate for the seven-year-olds. A majority of responses were accurate for most children in all but the visual stress task. The seven-year-olds were dissimilar in their response accuracy in the three visual tasks and the lingual nonstress task. Both the kinesthetic tasks, lingual stress, and reading tasks showed the seven-year-olds alike in the accuracy of their responses. Child 2 was the most consistently inaccurate of this group in task responses.

Related to the group profile, the individual analysis of the seven-year-old group is quite consistent. From child to child, the seven-year-olds were more alike than the younger children, and the individual responses are, for the most part, appropriately reflected in the group profile.
TABLE X

SENSE MODE ACCURACY AND TASK ACCURACY IN PERCENT FOR SEVEN-YEAR-OLDS (N=6)

<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Accuracy</th>
<th>Task Accuracy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83</td>
<td>36</td>
<td>73</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>38</td>
<td>62</td>
</tr>
<tr>
<td>3</td>
<td>93</td>
<td>60</td>
<td>88</td>
</tr>
<tr>
<td>4</td>
<td>73</td>
<td>72</td>
<td>65</td>
</tr>
<tr>
<td>5</td>
<td>88</td>
<td>53</td>
<td>93</td>
</tr>
<tr>
<td>6</td>
<td>89</td>
<td>50</td>
<td>79</td>
</tr>
</tbody>
</table>

| x²   | 3.07           | 17.84         | 9.97          | 3.57             | 4.3              | 51.31         | 43.62          | 23.74           | 28.19           | 4.73    | 8.04 |

| p    | <.7            | <.01          | <.1           | <.7              | <.5              | <.001         | <.001          | <.001           | <.001           | <.5    | <.2  |
For the nine-year-old children, Table XI reports the sense mode frequency and accuracy level of responses.

**TABLE XI**

**SENSE MODE FREQUENCY AND ACCURACY LEVEL IN PERCENT**

**FOR NINE-YEAR-OLDS (N=6)**

<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Mode Frequency</th>
<th>Accuracy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
</tr>
<tr>
<td>1</td>
<td>34</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>31</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>57</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>52</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>64</td>
<td>5</td>
</tr>
</tbody>
</table>

Table XI shows that four children in the nine-year-old group offered most of their responses in the kinesthetic mode. Three of these students (the three girls) offered approximately 30 percent more responses in the kinesthetic than the lingual mode. From child to child, the frequencies of responses in each sense mode were not alike. Therefore, unlike the younger children, a clear-cut pattern of frequency in sense mode responses was not apparent. Each child offered a higher percentage of accurate than inaccurate responses; however, the children were not alike in the
### TABLE XII

**SENSE MODE ACCURACY AND TASK ACCURACY IN PERCENT FOR NINE-YEAR-OLDS (N=6)**

<table>
<thead>
<tr>
<th>Child</th>
<th>Sense Accuracy</th>
<th>Task Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kinesthetic</td>
<td>Visual</td>
</tr>
</tbody>
</table>
| 1     | 71             | 53            | 68            | 100         | 63           | 100             | 42       | 100               | 89            | 65      | . . |*
| 2     | 69             | 47            | 67            | 95          | 50           | 100             | 33       | 100               | 100           | 100     | 61  | . . |*
| 3     | 70             | 73            | 64            | 89          | 54           | 100             | 57       | 100               | 100           | 59      | 60  |     |   |
| 4     | 87             | 53            | 85            | 92          | 86           | 100             | 30       | 100               | 100           | 84      | 100 |     |   |
| 5     | 90             | 38            | 47            | 89          | 92           | 100             | 29       | 100               | 100           | 41      | 92  |     |   |
| 6     | 88             | 80            | 59            | 100         | 85           | 100             | 0        | 100               | 86            | 50      | 100 |     |   |
| $X^2$ | 6.45           | 22.28         | 11.91         | 1.35        | 23.07        | 55.38           | 4.28     | 17.73             | 12.36         |         |     |     |   |
|       | p<.3           | p<.01         | p<.05         | p<.95       | p<.01        | p<.001          | p<.001   | p<.7               | p<.05         |         |     |     |   |

*Omitted in $X^2$ computation.
to the kinesthetic nonstress and lingual nonstress tasks. The kinesthetic stress task varied significantly with the girls being approximately 30 percent more accurate than the boys. Dissimilar responses among the children can also be reported for the visual stress, lingual stress, and reading tasks. Only four of the six children offered responses to the reading task. Therefore, a pattern seemed to exist in the accuracy with which the nine-year-olds drew a syllable pattern, clapped a syllable pattern, matched the syllable pattern with a word, and identified a prepared symbol for a pattern.

In considering the relationship between the individual and the group profile, the individual differences in frequency of sense mode responses and the accuracy levels are not reflected in the group results. Also, more variation existed in the individual accuracy of sense mode and task responses than is evident in the group compilation. Therefore, some considerations of individual's responses in the nine-year-old group are not accounted for in the group report of study results.

Qualitative Analysis

Results of the lessons and discussions in the lesson transcripts (as presented in Appendix F) provided the data for a qualitative analysis of the study. This researcher found that some characteristics in responding were peculiar
to one age group, and some could be observed in each age group. Consequently, the format appearing here presents the summary of results which (a) were seen as characteristic of a particular age group, and (b) seemed to be characteristics common to each age group. Both the age group results and the total group results are classified according to sense mode.

Five-Year-Old Children

Kinesthetic Mode.—

1. When only one syllable was clapped for two- or three-syllable patterns, the clap was always on the stressed syllable. (See Transcripts, Appendix F, pp. 191, 203.)

2. Generally, the children tended to clap too many times for a two-syllable pattern, as if they could not control their movement. (See Transcripts, Appendix F, pp. 191, 199.)

3. Coordinating the clapping of a word with the simultaneous saying of it was difficult but improved with practice. (See Transcripts, Appendix F, pp. 191, 199.)

4. Initially, the kinesthetic mode was a tool of the teacher for demonstrating a sound pattern or used by the students as a task response. Eventually, the children began to use the tool on their own for the purpose of examining the lingual pattern. (See Transcripts, Appendix F, pp. 196, 203, 206.)
5. Children having difficulty performing a speech rhythm pattern accurately seemed to benefit from having the pattern tapped on their hand or shoulder by the teacher. (See Transcripts, Appendix F, pp. 191, 199, 200.)

**Lingual Mode.--**

1. One syllable words were the easiest to symbolize kinesthetically.

2. Although the children were not able to express verbally which syllable was stressed, they were able to perform the stress by clapping on that syllable "automatically."

3. The fluency of speaking a word tended to suffer when the kinesthetic mode was attached to it, and simultaneous performance of the lingual and kinesthetic modes was difficult, especially in the beginning lessons. (See Transcripts, Appendix F, pp. 191-193.)

**Visual Mode.--**

1. The visual symbolizations had little relationship to the experiences the five-year-old children previously had with the syllable patterns of speech sounds. Most often the children drew a picture of the word-object, e.g., rug for "floor" and their own picture for their "name." Only two children seemed to make the connection with the sound pattern. (See Transcripts, Appendix F, pp. 198, 204,205.)
Seven-Year-Old Children

Kinesthetic Mode.—

1. The children were generally accurate in clapping one- and two-syllable word patterns, and almost immediately began using the kinesthetic mode as a tool for examining the lingual. (See Transcripts, Appendix F, pp. 209, 214.)

2. Stamping presented no major problems for kinesthetic symbolization of word ideas, but tended not to allow for fluent performance of stress patterns. (See Transcripts, Appendix F, p. 215.)

3. As the children became confident in the syllable patterns of their name, their kinesthetic ideas for symbolizing became more student-initiated and self-developed.

4. In performing sound patterns to selected instrumental music, the children were accurate and fluent in the lingual mode, but the kinesthetic mode was found to be inaccurate and cumbersome. (See Transcripts, Appendix F, pp. 231-232.)

5. In an activity where jumping a speech rhythm pattern was the response, the pattern of the word needed to be clapped in order for the children to accurately jump to it. This may suggest that not all movements are equally appropriate for sound symbolization. (See Transcripts, Appendix F, pp. 219-220.)
Lingual Mode.—

1. The children's word matching contributions were easily made for the one-syllable pattern, and saying the word aloud simultaneously with the clapped pattern tended to be a typical response. It is not known to what extent this lingual response monitored the kinesthetic.

2. One- and two-syllable words were easier to match than three- and four-syllables, and initial comparisons did not involve concern with the stress-nonstress relationships.

3. Converting the syllable pattern of a familiar word (a child's name) became a "play" with the children as they added and subtracted syllables in order for the word to fit a visual or kinesthetic clue. (See Transcripts, Appendix F, pp. 214-215, 218-219, 222-223.)

4. Two children were able to hear familiar word patterns in the instrumental music presented with little difficulty and minimal prompting from the teacher. (See Transcripts, Appendix F, pp. 226, 228, 231-232.)

5. In performing sound patterns to instrumental music, the children were accurate and fluent in the lingual mode, yet inaccurate in the kinesthetic mode. (See Transcripts, Appendix F, pp. 231-232.)

Visual Mode.—

1. Visual symbolization tended to be much imitation of other student ideas and began as a picture of the kinesthetic
gesture (clapping), and of the word meaning (upside-down figures for "down"). (See Transcripts, Appendix F, pp. 212-213, 224-226.)

2. The children seemed easily able to understand, read, and match new words to the neume patterns. (See Transcripts, Appendix F, pp. 218-219, 220-221, 229-230.)

3. In visual symbolization, the children relied generally on connecting a picture with the word meaning, and were mostly accurate in representing the syllables of the given word. Frequently, their explanations showed that their intentions were correct for the symbolization, yet the correctness was not apparent from the visual symbol alone. (See Transcripts, Appendix F, pp. 212-213, 224-226, 232-234.)

4. To listen to a pattern that was played on a recorder and to make a visual symbol for that pattern were procedures which, presented as a series of items, were too difficult for the children. Their symbols tended to be more a result of what they wanted to draw, e.g., a design or a picture of something associated with the pattern, than an accurate symbolization of the sound. Again, the children's explanations showed more understanding of the task than did their written symbols alone. (See Transcripts, Appendix F, pp. 232-234.)
General Comments.—Recognizing that a movement could be a symbol for a word and that a word could be suggested by a movement seemed acceptable to these children. They appeared to be more able to accept the various ways of expressing the same sound pattern than the younger children. In the reading activities, all the children were fairly consistent in combining the tools of saying the word aloud and clapping the pattern in order to match the word to the neume.

Identifying the proper neume for a speech rhythm pattern was enhanced by singing the pattern within the song. There was much indecision in identifying the stressed syllable of the pattern when the word was merely spoken; yet, when sung in the song, the stressed syllable was more easily located.

Nine-Year-Old Children

Kinesthetic Mode.--

1. Movement was a tool used almost immediately by several of the students as a check for the syllable pattern of a word. Some accompanied this sensory analysis by figuring out cognitive explanations for sound patterns (how many syllables, loud-soft, long-short discriminations).

2. The children had very few problems clapping the names and putting new movement gestures to the names.

3. Accurate performance of the kinesthetic response to a visual neume sometimes was more the non-aural "reading" and "hand motion" to the loud-soft syllables than it was fluent
performance of the pattern. To clarify, the students occasionally performed the hand motions mechanically from the visual symbol rather than matching the motion with the sound of the pattern.

**Lingual Mode.**

1. The nine-year-old students were more skilled than the younger ones at creating nonsense words for pattern matching. Rhyming was also a primary means of creating new words to a given pattern. (See Transcripts, Appendix F, pp. 241-242, 244-245, 253.)

**Visual Mode.**

1. Visual representation was much easier for these children than for the five- and seven-year-olds. They were generally accurate in drawing a symbol that showed the correct syllable pattern for their names. The children used common graphic representations as symbols (checks, dots, stars, etc.). (See Transcripts, Appendix F, pp. 240-241, 243-244, 263-264.)

2. Visual representation of the speech rhythm patterns seemed easy for the students as they were able to identify and demonstrate the aural/lingual, kinesthetic, and visual connections with the symbols. As they explained their symbols, several followed the graphic parts with the word syllables. (See Transcripts, Appendix F, pp. 243-244, 263-264.)
3. Visual symbols for syllable patterns were quite accurate, but the accuracy decreased when the stress pattern was requested. More student-suggested rather than teacher-suggested symbols were also evident at this age for choices in visual representation.

General Comments.—In order to determine whether or not a pattern would "fit" a given sensory clue, the nine-year-old children relied heavily on covert rather than overt aural discrimination of a pattern. Instead of offering their perceptions through sensory demonstration, the nine-year-olds frequently attempted to verbally describe/discuss the patterns. (See Transcripts, Appendix F, pp. 236, 242, 245-246, 248.)

Although the students were proficient at deciding how many syllables were in a pattern and used clapping for determining this, they were not accustomed to focusing on the stress relationships of the syllables. It was typical to witness the students' attempts to determine the stress pattern without focusing on the sound of the pattern. (See Transcripts, Appendix F, pp. 242-243, 245-247.)

The nine-year-old children were able to move more quickly than the younger children into hearing, identifying, labeling, and substituting activities for speech rhythm patterns within song phrases rather than only at phrase cadence points. Their skills for pinpointing patterns within a
larger stream of sound seems more developed than the younger children's. (See Transcripts, Appendix F, pp. 250-252, 256-257.)

Notation of a pattern that was played on the recorder was much more successful with this age than the seven-year-olds. In some cases, the representative symbol for a pattern was correct, but the representative word was not. Sometimes a symbol resembled the pattern, but the child's explanation confused the visual response. The activity of listening to instrumental patterns did show an ability of the students to recognize and identify patterns in music, even though inaccuracies may have existed in part or all of their modal interpretations of the pattern.

All Ages

The preceding presentation of study results was organized according to age level and sense mode tendencies, and represented characteristics peculiar to each age. The following qualitative results are presented according to sense modes and were found to be common among the three age groups of five-, seven-, and nine-year-old children.

Kinesthetic Mode.--

1. Clapping tended to be more accurate than any other movement for symbolizing speech rhythm patterns.

2. Clapping served to help determine how many syllables were in a word, while purely lingual sound did not readily offer this information.
3. Students became increasingly more proficient at using the kinesthetic mode as their own means of checking lingual patterns and to examine comparisons between word patterns.

**Lingual Mode.—**

1. Lingual matching tended to follow a procedure of rhyming, common initial consonants, and association with the given word rather than focusing only on the syllable stress pattern. (See Transcripts, Appendix F, pp. 194, 195, 211, 212, 213, 253, 256.)

2. Initially, the song was a tool of the teacher for presenting and singing a speech rhythm pattern in the melodic, rhythmic context. Eventually, however, it became a tool of the students for putting their lingual ideas into the song framework as a check and a context for the matched pattern. (See Transcripts, Appendix F, pp. 196, 213–214, 238–240.)

3. The ability of some children to say how many syllables were needed for a pattern or how many syllables were in a word often did not insure that they would find a lingual match. The children's discrimination skills were not directly apparent in their performance skills. (See Transcripts, Appendix F, pp. 194–196, 213, 227, 245–247, 248–249.)

4. The names of the students as labels for speech rhythm patterns seemed to hold more intrigue and to elicit more responses than any other verbal labels.
Visual Mode.--

1. The prepared symbols seemed to have immediate meaning for the students. With little or no preparation, the children were able to read the symbols as they pronounced the appropriate word and simultaneously followed the squares.

2. The stress differentiation of the black and white squares seemed to be understood by the children and observably influenced how they were able to kinesthetically demonstrate the stress/nonstress pattern of a word.

3. An evidence of reading the prepared visual neume occurred when the accurate reading of the symbol took precedence over the appropriate word pronunciation. (Ex: "John" followed from the Xx neume becomes "John-a"). (See Transcripts, Appendix F, p. 202.)

General Comments.--The activity of clapping seemed to provide an aural, kinesthetic clue which tended to be important to the children in determining how many syllables were in a word pattern. Being able to make decisions about a speech rhythm pattern, however, seemed to represent an ability which did not necessarily insure that a child could perform a matching pattern. Familiarity with hearing a certain pattern seemed to influence the ability to discriminate and perform that pattern in various settings. (Ex: Kari with the xX pattern and Emily with the Xxx pattern.) (See Transcripts, Appendix F, pp. 200, 202, 227, 231.)
The simplicity of the visual neume made the symbol offer an almost immediate meaning to the children, and coordinated the multi-sensory performance of a speech rhythm pattern. (See Transcripts, Appendix F, pp. 201-206, 220-221, 247-249.) It is possible that the location of the speech rhythm pattern that was to be matched in the song influenced the facility with which the children were able to focus and match it with another pattern. Phrase cadences provided the most obvious and perhaps easiest points of focus.

From lesson to lesson, accurate performance of speech rhythm patterns in any mode remained inconsistent. An activity in which most responses were frequently correct in one lesson did not necessarily render those same correct responses when the activity was repeated. Intentions to explore the possibilities for symbolizing speech rhythm patterns did not always result in accurate responses. Having too many choices available for symbols tended to impede focus on accuracy. (See Transcripts, Appendix F, pp. 192, 199, 230-231, 245-247.)

When a word was simply pronounced, the children were not easily able to discern the normal stress pattern or distortion. Facility in recognizing the distortion resulted when the word was situated onto the melodic rhythm pattern of the song. Sensory symbolization was consistently improved when accompanied by the song. (See Transcripts, Appendix F, pp. 194, 197, 200-201, 215-216, 222-224, 242, 245-247, 253, 259.)
When a pattern was played or presented to the children, they generally were able to give an accurate kinesthetic, lingual, and neume identification symbol for the aural pattern, yet were inaccurate in making a representative visual symbol.

Summary of Quantitative and Qualitative Results

It was originally intended that the quantitative and qualitative results of this study would be presented according to the research problems--by age, by sense mode, and by age and sense mode. It became obvious from the analysis of responses, however, that separation of sense mode qualities and age qualities was not possible. The children's sense mode responses were to a great extent dependent upon their age, and the age of the children frequently determined the role and use of the sense modes. Therefore, the format for a summary of Chapter IV will be sectioned according to age with the final section being a comparison of sense mode responses between ages.

Five-Year-Old Children

The lingual mode was most often presented and requested by the teacher; however, the kinesthetic mode was most frequently used by the children. After the first few lessons, the children began to use the teacher's tool (clapping) as their own tool for examining the speech rhythm
patterns. The children were similar in the proportions of responses offered in each sense mode.

Although the five-year-olds were the most inaccurate of the three age groups, all but one child were accurate more than inaccurate in their sensory responses. Each child was almost twice as frequently accurate in the lingual as in the kinesthetic mode. Symbolization in the visual mode was extremely inaccurate and the children seemed unable to relate the sound pattern to the visual drawings. Synchronized combination of the kinesthetic and lingual modes was difficult for the children in the beginning lessons. The accuracy of the kinesthetic and visual modes differed significantly from child to child; the lingual mode, however, was a consistently accurate mode for the five-year-old children.

Frequency of accurate responses for each child varied from task to task. Lingual nonstress and reading were the most frequently accurate tasks, and visual nonstress and kinesthetic nonstress were the most frequently inaccurate tasks for the five-year-old children.

**Seven-Year-Old Children**

The seven-year-old children were the only group which showed prominent use of a secondary mode (kinesthetic) for task response as they used the teacher-presented tool (clapping) for their own learning aid. Each child responded
approximately three times as frequently in the kinesthetic as the lingual mode. Little difference occurred from child to child in percentages of frequency within each mode.

Each child was more frequently accurate than inaccurate. Five out of six children differed in the accuracy with which they responded in each sense. Five out of six children were most accurate in the kinesthetic mode; and one showed his highest accuracy percentage in the lingual mode. The seven-year-olds were most consistently accurate in the kinesthetic mode, although they were not significantly more accurate in the kinesthetic than other modes. They had minimal problems coordinating clapping to lingual sound patterns.

Each child varied in the percentage of accurate responses in each task, and no one task could be pointed out as being most accurate for several of the children. From child to child, the seven-year-olds differed significantly in the accuracy with which they performed the visual nonstress, visual stress, visual prepared, and lingual stress tasks. Seven-year-olds were most consistently accurate in the kinesthetic nonstress task.

Although they were able to perform lingual patterns to instrumental music, the seven-year-olds were generally inaccurate in the kinesthetic mode for the same task. The visual nonstress symbols frequently did not resemble the sound pattern, although the accompanying explanations may
have shown accurate understanding. Singing the pattern in a song, seemed to help identify the stressed syllable for each of the stress tasks.

**Nine-Year-Old Children**

Responses were most frequently in the kinesthetic mode for four children and in the lingual mode for two children. The children seemed already proficient at using the kinesthetic tool for performing speech rhythm patterns and used it extensively. From child to child, the nine-year-old children were significantly different in the frequency with which they responded in each mode.

Each child was more frequently accurate than inaccurate in responding. Only two out of six children showed noticeable differences in the accuracy with which they responded in each sense. Although each child was most frequently accurate in the kinesthetic mode, there were generally slightly higher percentages of accuracy in the kinesthetic than the lingual mode. Significant differences existed from child to child in the accuracy percentages of the visual and lingual modes. Kinesthetic was the most consistently accurate mode of response for the children. As a group, the nine-year-olds tended to be more facile than the younger ones in using each sense mode accurately. Individuals did differ, however, in sense mode frequency and accuracy.
Each of the nine-year-old children showed variance in the accuracy with which they responded to the tasks. No inaccuracies for any child were found in the visual nonstress and visual prepared tasks. This was the most obvious difference in task accuracy between the five- and nine-year-olds. Four out of six children were 100 percent accurate in the lingual nonstress task. The most difficult was the visual stress task. Significant differences in accuracy from child to child among the nine-year-olds were reported in the kinesthetic stress, visual stress, lingual stress, and reading tasks. The nonstress tasks were more accurate than the stress tasks, and singing the pattern in a song seemed to help identify the stressed syllable.

Comparison of All Ages

The lingual mode was presented to and requested from all three ages more frequently than the other modes. Each age, however, responded most frequently in the kinesthetic mode. Each age group responded with differing frequency in the kinesthetic, visual, and lingual sense modes; however, the percentage of responses in each sense mode did not significantly differ between the age groups. The children in the five- and seven-year-old groups were similar in the frequency with which they used each sense mode, the nine-year-olds were not.

Each age was significantly more accurate than inaccurate, and significant differences were reported in the "somewhat
accurate" and "inaccurate" categories between groups. All but one child in the three groups were more frequently accurate than inaccurate. All of the five- and seven-year-olds, but only two of the nine-year-olds, showed significant differences in accuracy according to sense mode. All of the five-year-olds and one seven-year-old child were most frequently accurate in the lingual mode. Lingual matching tended to follow a procedure of rhyming, common initial consonants, and association with the given word rather than focusing only on the syllable stress pattern.

Five of the seven-year-olds and all of the nine-year-olds were most frequently accurate in the kinesthetic mode. Clapping tended to be more accurate than any other movement for symbolizing speech rhythm patterns. Five-year-olds were most consistently accurate in the lingual mode, and seven- and nine-year-olds were most consistently accurate in the kinesthetic mode.

Each child of all three ages showed differences in the accuracy with which they performed the tasks. Five-year-olds were most accurate in the lingual nonstress and reading tasks. Nine-year-olds were most frequently accurate in the visual nonstress, visual prepared, and lingual nonstress tasks. Seven-year-olds varied in task accuracy from child to child. The accuracy of the visual prepared and reading tasks seemed to be positively influenced by the simplicity and obvious function of the neume notation. The names of the
students as labels for speech rhythm patterns seemed to hold more intrigue and to elicit more responses than any other verbal labels in the lingual tasks.

Being able to make decisions about a speech rhythm pattern (how many syllables, where the stress occurs) did not insure accurate task performance for the quantitative analysis. The kinesthetic mode seemed important for the children to determine how many syllables were in a given pattern. From lesson to lesson, accurate performance of speech rhythm patterns in any mode remained inconsistent. Having too many choices available for symbolization tended to impede focus on accuracy, especially when proficiency with a pattern in any one mode had not yet been established. If any visual nonstress or visual stress task accuracy was accomplished, it was seldom done without the aid of the secondary lingual and kinesthetic modes.
CHAPTER V

SUMMARY OF RESULTS, CONCLUSIONS AND DISCUSSION

The purpose of the present study was to investigate the multi-sensory responses of children to symbolizing musical sound through speech rhythm patterns. The research problems were (1) to determine children's responses to speech rhythm patterns according to the differential sensory modes used; (2) to determine children's responses to speech rhythm patterns by age; and (3) to compare children's responses to speech rhythm patterns by age and sensory modes.

Speech rhythm patterns consist of the number of syllables and the stress/nonstress relationships of these syllables in a word or a phrase. When speech rhythm patterns are presented in the context of song-games, children can demonstrate their perception of these stress/nonstress relationships by movement, visual, and lingual responses. It is believed that such concrete demonstrations of sound pattern perception is an essential beginning step in the preparation of music literacy. The symbolizations of sound through kinesthetic, visual and aural/lingual techniques are assumed to function as learning tools by which children represent a heard musical pattern. Currently, it is not known to what extent each of these senses positively influences music learning. Further, it
is not known how music learning is affected by multi-sensory experiences with sound patterns.

In order to explore the above questions, eighteen five-, seven- and nine-year-old children were observed in their use of speech rhythm pattern symbolization through visual, kinesthetic and lingual means. The children were divided by age into three groups so that each group consisted of six children. All groups met for four weeks in daily thirty-minute music classes. The researcher taught all classes. Each session was video-taped.

The lessons consisted of song-game activities which focused on the introduction, exploration and practice of speech rhythm patterns. A series of tasks was presented to the students which requested a variety of sense mode responses. The tasks for this study were identified by the sense mode or modes in which the teacher presented the task (kinesthetic, visual or lingual) and the sense mode or modes in which the children were requested to respond. The task sense modes were further identified by noting whether the teacher emphasized the stress relationship or simply the syllable relationship (nonstress) in the presentation mode and the requested responses.

For a quantitative analysis of the responses, the video-tapes of the lessons were analyzed according to a prepared rating/observation form, the Student Response Assessment Form. Two observers coded each child's responses according
to sense mode and accuracy. Double- and triple-codings were used when a student responded with more than one sense mode. All observed responses were converted into percentages according to age, child, sense mode, task and accuracy. Rater consistency was determined by re-assessing ten randomly chosen lessons and comparing the percentages of the two sets of observations. This yielded a Scott coefficient of .79 (good agreement). For comparison of percentages in frequency and accuracy, the chi square statistic was used where appropriate in order to determine the degree of difference between percentages.

Summary of Results

It was originally intended to discuss the results of the study in terms of the research problems, treating the sense mode and age differences separately. After analyzing the quantitative and qualitative results, however, it was found that children's responses according to age and sense mode were interdependent. Therefore, it was necessary to summarize and discuss the study results by recognizing this relationship of age and sense mode.

All three age levels used similar proportions of responses within the kinesthetic (59 percent), visual (13 percent), and lingual (28 percent) modes. Although the teacher's presentations and requests tended to focus on lingual symbolization, the students' responses occurred most frequently in the
The seven-year-olds were the only group to show a prominent use of the kinesthetic mode as a secondary, supplemental response mode. Regarding individuals' responses, the nine-year-olds varied in the frequency with which they used each sense mode, whereas the five- and seven-year-olds were more similar in their respective groups.

In considering accuracy of responses, only one child of the eighteen was more frequently inaccurate than accurate in this study. For the nine-year-olds, one sense mode was not obviously more accurate than any of the others. Each of the five-year-olds was approximately twice as frequently accurate in the lingual as in the kinesthetic mode. The seven-year-olds were generally only ten percent more frequently accurate in the kinesthetic than in the lingual mode. Although each of the nine-year-olds showed a higher percentage of accuracy in the kinesthetic mode, four of six in the group had only slightly higher accuracy percentages in this mode.

Particular characteristics were observed in the types of responses children made in each sense mode. Regarding sense accuracy, the making of a visual symbol was the most difficult task for the five-year-olds and the seven-year-olds. The nine-year-olds were consistently accurate in making a visual symbol for the syllable pattern, yet when asked to show the stress pattern in their visual symbols, they were generally inaccurate. Following a prepared visual symbol was easier for
each age than accurately making their own symbols for the speech rhythm patterns.

Stress tasks were generally more difficult than non-stress tasks for all ages and all modes. No stress tasks were requested from the five-year-olds except in the lingual mode. The higher percentage of responses in Category 2 "somewhat accurate" for the nine-year-olds reflected the increased requests for stress responses from this age group. This category revealed the percent of responses which had the correct number of syllables, yet incorrect stress pattern. The tasks which showed most similar accuracy levels across the three ages were lingual stress, lingual nonstress and reading, which was defined as a multi-sensory activity.

All groups tended to rely on rhyming, common initial consonants and word association for their means of finding a lingual match for a given word. Whereas, the students' own names were the most frequently used and accepted labels for a given pattern, the kinesthetic mode seemed invaluable to the students for determining the number of syllables in a pattern and the stress pattern relationships. Clapping was the kinesthetic response most frequently used and most frequently accurate with all ages. The students were often observed using the kinesthetic mode (clapping) on their own as a tool for hearing a syllable pattern. In visually symbolizing a pattern, the seven- and nine-year-old children
seldom attempted to make the drawing without first checking its qualities through the kinesthetic and lingual modes.

There were frequent examples of a student being able to accurately describe, explain or analyze verbally the characteristics of a pattern (syllables and stress) without being able to perform or match it in a sense mode. The accuracy of each child's responses from lesson to lesson and task to task was in general, inconsistent. Consistency in responding accurately, however, did seem to improve with age. The accuracy of responses tended to diminish when too many choices were allowed for symbolizing a given pattern. This was especially true when the given pattern had not yet been practiced thoroughly in the lingual and kinesthetic modes.

Limitations of the Study

The results and conclusions of the present study must be seen in light of its inherent limitations. It is recognized that the small population of children (eighteen) and the time span of the study should prohibit one from generalizing the observed characteristics to a larger population. Furthermore, the learning situation of (a) small class size (six); (b) voluntary attendance; (c) no curriculum demands; (d) an adjunct teacher; and (e) parent approval for participation may be considered atypical of a traditional classroom setting. Although the project was conducted in a four-week time frame, special occasions, field trips and absences influenced the
amount of class time spent with the children, and, consequently, influenced the frequencies of observed responses.

Observing responses of individuals within a group of children posed inherent difficulties. When responding in the kinesthetic mode, it was possible for the children to be spontaneous and repetitious. Unlike the lingual mode, it was relatively easy for the raters to observe kinesthetic responses although several children may have been moving at the same time. The children frequently clapped to check a pattern at times when it was not their "turn" in the song activity. The coding procedure, however, did account for these responses. Verbalizations were less obvious and difficult to hear.

While kinesthetic and lingual responses were frequently performed at various times during the lessons, visual responses were totally dependent on the teachers' planning of those specific tasks. The nature of the procedure for visual symbolization (drawing a symbol on a paper) impeded any impromptu or individual usage of this mode. More than any other response, the frequency of the visual nonstress and visual stress responses were dependent on the task frequency.

Only those lingual responses were coded which were intended to match a given pattern, not those which were simply a verbalization of the pattern. For example, if a child was asked to find a word to match a clapped stressed or nonstressed pattern, his initial response of "Eric" (Cc)
was coded as an accurate lingual response. If he continued saying "Eric" as he clapped several times, checking his answer, the lingual responses were not coded. At the time of the coding, it was decided that matching a pattern was not synonymous with performance of it in the lingual mode because the children were merely repeating familiar words. It was reasoned that the lingual mode served a dual role in the study (as a basis for the technique and as a means for demonstrating a sound pattern) and should be coded accordingly. Therefore, many more lingual responses were given by the children than were coded.

In summary, the percentages of observed responses tended to be dependent on the nature of the sense modes and the type of coding used. Therefore, reported observed responses did not necessarily reflect a sense mode preference by the children. In this study, sense mode frequency may not be as revealing a measure of multi-sensory responses as sense mode accuracy.

It must also be recognized that clear-cut lines do not necessarily exist between the sense modes. For the purpose of the study and the research problems, the responses were categorized as either kinesthetic, visual or lingual. Kinesthetic symbolizations can be seen (visual), however, and they were also inextricably connected with the lingual pattern they were to represent. Also, the production (verbalization) of a speech sound is typically physical.
movement and this dual sensory involvement, though slight compared to gestures, cannot be ignored. Therefore, in several ways, each sense mode possesses degrees of the others.

Conclusions

In recognizing the limitations of the present study and interpreting the reported results, the conclusions are offered in the following order: (1) multi-sensory responses; (2) reading tasks; (3) accuracy of responses; (4) visual responses; (5) kinesthetic responses; (6) lingual responses; (7) stress/nonstress tasks; (8) individual children's responses.

Multi-Sensory Responses

The results of this study would support the assumption that a multi-sensory approach to symbolizing speech rhythm patterns is a more feasible teaching and learning tool than a single mode approach. It became apparent in the quantitative and qualitative analyses of each child's responses that differences existed among ages and individual children in the accuracy and frequency with which they used each sense mode. In addition to these obvious individual and age differences, the children were often observed using a combination of sense modes for symbolizing speech rhythm patterns. Most frequently, the lingual and kinesthetic modes were used simultaneously for pattern performance, yet the combination of all three modes seemed to positively influence the accuracy of the reading tasks. The effect of combining the saying
of a word and pointing to read a visual neume seemed to improve and reinforce the accurate performance of stress pattern relationships in each mode. This effect was evident with each age group, yet with the five-year-old children, it offered the most apparent contrast to their single mode performance accuracy. While the five-year-olds were generally inaccurate in the kinesthetic and visual mode responses, the combination of these modes through the reading tasks yielded an accuracy rate of 83 percent.

The incidence of using a secondary mode for responding to a task was especially noticeable in the kinesthetic sense for the seven-year-olds. Although evidence existed that other sense modes were used to support the primary task mode, the kinesthetic sense provided the most obvious difference according to age. From the lesson transcripts, it can be seen that the nine-year-olds used clapping as an aid to their aural discrimination less frequently than the younger children. Rather, they tended to make intellectual, non-performing decisions about the patterns (how many syllables, which was the stress sound, etc.). In contrast, the five-year-olds seemed to lack the needed proficiency in the kinesthetic mode for using it effectively as a tool for linguistic or visual symbolization of the speech rhythm patterns. Also, the five-year-old children were frequently not cognizant of the interrelationship of the modes for pattern performance. Almost half of the seven-year-olds' observed kinesthetic
responses were supplemental uses of clapping for task response. Therefore, the multi-sensory approach of offering experiences in all three modes was applied in the childrens' responses by their using the modes (particularly kinesthetic) interchangeably as tools for symbolizing. Individual differences were seen as to which modes were most useful for speech rhythm pattern symbolization.

**Reading**

Treated as a multi-sensory task in the present study, reading yielded the most frequently accurate responses from the five- and seven-year-olds. Although the nine-year-olds were generally accurate in their responses to the reading tasks, the percentage of accuracy reflects that the patterns they were given were more challenging than the ones given to the younger children. The reading task involved a teacher-prepared symbol (Ex: □□□ ) to which the children tapped the stress pattern on the squares as they sang or said the word patterns. Reading the symbols in this way seemed to coordinate and monitor the combination of sense modes for a synchronized performance of the speech rhythm patterns. It may have been the positive influence of this multi-sensory combination which resulted in less accuracy difference between ages in this task than in any other.
Accuracy of Responses

Regardless of sense mode the responses of each age group were more frequently accurate than inaccurate. This could indicate that the tasks were too easy for the children; however, this study aimed at observing how the children responded to a variety of tasks and how consistent their responses were rather than at finding the limits of accuracy in their responses.

The seven- and nine-year-olds did not show a pattern of any one sense mode being most accurate for their responses. The five-year-olds, however, showed apparent differences in sensory responses by being most frequently accurate in the lingual mode and least frequently accurate in the visual mode. The results could reflect a "levelling off" of proficiency for the older children within each of the three modes. Five-year-olds, either from lack of prior training or developmental skills did not seem to have these abilities across modes. Considering the kinesthetic, visual and lingual responses, only the lingual mode showed little difference in accuracy between the three age groups.

Visual Mode

Through comparing task accuracy, it became apparent that the use of the visual mode reflected the greatest age differences. In making a visual symbol for the syllable pattern of a word, the five-year-olds were seldom accurate; the
seven-year-olds were accurate about half of the time; and the nine-year-olds made no errors. From the lesson transcripts, it was apparent that prominent differences between ages existed in the accuracy of visual symbols as well as the types of visual symbols used. The five-year-olds generally made no connection between the symbol they made and the sound pattern it was to represent. Their pictures showed word meaning or objects with no apparent representation of the pattern of speech sound. The seven-year-olds used similar types of symbols as the five-year-olds (generally depicting word meaning), yet were often able to arrange the symbols to show a syllable pattern (number of units). The nine-year-olds were much more fluent than the younger age groups in drawing familiar symbols (check marks, dots, stars, etc.) to accurately represent the syllable pattern of a word.

As stated earlier, the developmental difference between the ages was most apparent in the visual mode when the children were asked to draw a symbol for the sound pattern. This difference was not apparent, however, when the children were asked to identify a prepared symbol (□■ ). The prepared symbol provided contrasts from the childrens' abilities to make a visual symbol and to follow a visual symbol. Although the seven-year olds did not immediately connect the sound stress pattern with the corresponding black and white square relationships of the neumes (77 percent accurate), they were much less accurate when asked to draw a stressed pattern symbol
(14 percent accurate) with the same information. Compared to making a visual stress pattern (36 percent accurate), the nine-year-olds were also noticeably more often accurate (100 percent) in identifying these same characteristics in a prepared symbol. Although the five-year-olds were not asked to draw the stress pattern of a word (based on their inability to draw the syllable pattern), they were able to identify and perform the stress pattern through the prepared symbol of the reading tasks.

Kinesthetic

The seven-year-olds seemed to rely heavily on "checking" the pattern for a lingual or visual response by clapping it. Unlike the five-year-olds, the seven-year-olds were generally accurate in the kinesthetic mode and consequently found it helpful for pattern identification. And, unlike the nine-year-olds, the seven-year-olds tended to depend on the motor response rather than on intellectual reasoning for examining patterns.

Clapping the patterns of the speech sounds was the most common selected movement for all ages. The differences in accuracy of the kinesthetic mode between age groups may have been due to prior experience with this activity or the motor development levels of the ages and individual students.
Lingual Responses

Of the three sense modes, less discrepancy existed in the lingual mode between ages five and nine for the ability to symbolize sound patterns. Proficiency in this mode was particularly noticeable with the five-year-old children. Perhaps the a priori skills of speaking and listening to the tonal and rhythmic patterns of the language were more developed than skills in the kinesthetic and visual modes. A comparison of the accuracy levels for the tasks requesting stress responses would support this implication. The lingual stress and nonstress tasks showed similar proportions of accurate responses among the three age levels. Also, unlike the kinesthetic and visual sense mode responses, no apparent differences in accuracy existed between the lingual nonstress and the lingual stress tasks for the five- and seven-year-old children. The nine-year-olds, however, had 31 percent fewer accurate responses in the lingual stress task than they did in the lingual nonstress task. This difference in accuracy level for the oldest group could partially be attributed to the increased pattern difficulty given to these children. With each age level, the lingual mode seemed to be an easily performed and accurate mode for symbolizing musical sound through speech rhythm patterns.
Stress and Nonstress Tasks

The kinesthetic and visual nonstress tasks were so inaccurate for the five-year-olds that stress tasks were not requested from this group.

Although the kinesthetic stress and the lingual stress tasks for the seven- and nine-year-olds were more frequently accurate than inaccurate, this ability to demonstrate a stress pattern was not apparent in the visual stress task. Therefore, the accuracy with which the children demonstrated the stress pattern of a musical sound through the kinesthetic and the lingual modes was not efficiently represented in their visual symbolization.

It is interesting to note that the seven-year-olds tended to have less variance in accuracy between the stress and nonstress tasks than the nine-year-olds. This factor may partially be due to the difference in difficulty of the patterns presented to the children. In analyzing the video-tapes of the lessons and the children's responses, however, it was noticed that the nine-year-olds (unlike the younger children) tended to rely on verbal explanations for identifying speech rhythm pattern characteristics. If this was the case, then with the older children, the emphasis on intellectual reasoning rather than sensory symbolization may have affected their ability to aurally decipher the stress patterns.
Individual Children's Responses

Five-year-olds' responses.—One child, Child 5, seemed to show a pattern in his difficulty with sensory responses. Child 5 was seldom accurate kinesthetically (13%), yet was accurate 73% of the time in the lingual mode. As a group, the five-year-olds were similar in the proportions of their responses according to frequency and accuracy except for Child 5. In addition to the obvious difficulty with the kinesthetic mode and excelling in the lingual mode, Child 5 was noticeably less accurate in the reading task than the other children. The problems this child had when reading seemed to be related to integrating the senses by combining them into a performance of the speech rhythm patterns. Child 5 repeatedly had difficulty synchronizing the kinesthetic responses with the lingual sounds for accurate reading of the pattern.

Only two children were able to offer a degree of accuracy in making a visual symbol for speech rhythm patterns in the five-year-old group. These two were also the only ones who had made a connection between the symbol and the sound it was to represent.

Seven-year-olds' responses.—Child 4 tended to have more difficulty than the others in hearing the components of speech rhythm patterns and, in turn, symbolizing them in the three modes. Her responses were inconsistent in accuracy, and she
rarely matched a lingual pattern without needing to clap the word to be matched and the word she was offering as a response. For this child, the kinesthetic mode seemed essential to perception and symbolization of the sound pattern.

Child 2 was more frequently inaccurate than accurate in the lingual nonstress category. Although it was never quite clear why he had trouble in lingually matching a sound pattern, his auditory discrimination of the pattern was frequently inaccurate. Consequently, Child 2's difficulty with the patterns resulted in inaccurate responses in all three modes. At the time, it seemed as if this child did not understand that the technique explored was a sound pattern which was made up of individual components that combined to make a complete unit. This probable lack of understanding for the patterned quality of the sound resulted in Child 2's low accuracy rate for visual symbolization.

Nine-year-olds' responses.—In regard to frequency, the nine-year-olds had more equal proportions of responses between sense modes than the younger children, although each sense mode showed significant percentage differences among the children. These results could be interpreted in several ways. First, the results could show that the nine-year-olds have a proficiency for using each sense mode. Secondly, the differences in frequency of sense mode responses between the six children could indicate a less imitative stage of responding
than the younger children. Also, the wide differences in frequency of sense mode responses for the nine-year-olds could signal a beginning pattern of sense mode preference, dominance or fluency for symbolizing. It is not clear which one of these conclusions is the most likely to be true.

In recognizing that the kinesthetic mode was the most consistently accurate response mode for the nine-year-olds, it is interesting to note the magnitude of sense accuracy differences for Child 5. While she was more frequently accurate than the other children in the kinesthetic mode (90 percent), Child 5 was the least frequently accurate of her age group in both the visual (38 percent) and the lingual (47 percent) modes. Perhaps these results could indicate a dominant learning mode for Child 5. Child 6 showed similar accuracy levels in the kinesthetic and visual modes, but was noticeably less frequently accurate in the lingual mode. Child 3 showed a slightly greater level of accuracy in the visual mode, while Child 4 was noticeably least accurate in this mode. Children 1, 2 and 3 showed no apparent mode as being more frequently accurate than another. It may be possible that by nine years of age, children develop proficiency in each mode for responding, yet also begin to demonstrate an individual pattern of mode preference and accuracy.

The inefficiency of Child 3's responses in the kinesthetic stress task resulted in his difficulty with coordinating
the combined senses for the reading task (60 percent accuracy rate). Three children were most frequently accurate in responding linguistically to stress tasks and three excelled in the kinesthetic response to stress patterns. Child 3 was the only one who showed little difference in accuracy of the kinesthetic, visual and lingual sound symbolizations. The nine-year-olds, more than any other age group, showed evidence of individual differences in the frequency and accuracy with which they symbolized speech rhythm patterns.

Discussion and Implications

From considering the literature and research related to sensory aids (teaching tools) for music learning, questions were raised regarding (a) the type of sensory tools most effective in music learning; (b) the extent to which children make use of the various senses in music learning; and (c) the effect of the combined sense modes in music learning. The present research serves to sponsor additional questions regarding children's musical learning. As a beginning step in viewing how children respond to various teaching and learning tools, the study may provide a procedure for other music educators to follow as they observe and study what children are able to do at various ages. The results of this study are not intended to be generalized to a larger population of students, but rather to be seen as an attempt to glean information from a select group of children. The discussion and implications are presented here with these points in mind.
This section of the paper will generally follow the sequence of topics presented in the results and conclusions sections: (a) multi-sensory responses; (b) the role of song; (c) visual responses; (d) kinesthetic responses; (e) lingual responses; (f) general comments.

Multi-Sensory Responses

As stated in Chapter II, the perusal of various systems and materials for teaching music to children gave evidence of support for a multi-sensory approach to music learning. Activities are frequently recommended in such sources for accompanying music learning with movement, speech and visual aids to enhance the development of music listening and reading skills. No research was found which investigated the influence of combining the kinesthetic, aural-lingual and visual sense modes into a multi-sensory approach to music instruction. Although the influence of the sense modes on music learning was researched separately in several studies, it would seem logical that the combination of senses may produce different results. The present study supports this assumption by offering quantitative and qualitative evidence of the sense modes used singly and in combination by five-, seven-, and nine-year-old children.

While sense mode proficiency did tend to vary according to age, combination of the kinesthetic, visual and lingual modes for a reading activity generally produced more accurate
responses for each age group than single mode performances of the same pattern. Five-year-old children tended to be as proficient as the seven- and nine-year-olds at simple reading activities which involved kinesthetic, visual and lingual participation. The sensory integration which occurred as a result of the reading tasks tended to obscure the identification of which sense, if any, provided the stimulus for the activity. In some cases, it was unclear whether the child first thought of a word and consequently identified the appropriate visual symbol or used the reverse procedure in reading the symbols. Because the kinesthetic sense was often used throughout the task, this also may have been the initial symbol to which the lingual or visual match was made. Although the three modes were combined and coordinated for the reading task, it was impossible for the raters to determine which sense, if any, provided the monitor for synchronizing all three sense modes into an accurate performance of the speech rhythm pattern.

Only two children performed noticeably less efficiently at the reading task than the others in their age group, and both these children (Child 5 of the five-year-olds and Child 3 of the nine-year-olds) had problems in the kinesthetic mode. It is possible that difficulty in motor responses to sound patterns had a strong influence on a child's ability to integrate the senses for multi-sensory reading tasks. One might speculate that the senses fill different roles with
regard to reading. Inefficiency in the kinesthetic sense may provide greater impediments to fluent music reading than the other two senses. Conversely, music reading fluency might be attained from the visual and lingual modes alone.

The Song

The role of the song cannot be neglected in this discussion. While speech was always used in identifying and performing the visual prepared symbol (■ ), situating the pattern into a familiar song had a definite influence on the children’s ability to accurately demonstrate the stress/non-stress relationship of the pattern. The selected songs maintained a close relationship between the natural spoken intonation pattern of a word and the way in which the tonal and rhythmic setting of the word was performed in the song. Perhaps, the melodic intonation of the song context served to emphasize (without distorting) the flow of the stress/nonstress relationships of the pattern. As was seen, the children of each age group used this intonational emphasis to aid in correct pattern identification.

This writer holds that the song served as a catalyst and motivator for performing the speech rhythm patterns in the flow of a temporal framework. It was common to witness the children perform a pattern with no stress emphasis and "labored" syllabication particularly when they were first examining it. The intent of the speech rhythm pattern
technique is to maintain the normal intonation and flow of speech sound rather than to dissect the parts into contrived patterns.

Some children were more consistent than others in responding to a request for a lingual match by singing their answer in the song fragment which it was to fit. This observation has some validity from previous literature in which a technique known as Melodic Intonation Therapy has produced significant improvement in the verbal abilities of aphasic patients.¹ The method of Melodic Intonation Therapy involves sung intonation of prepositional sentences in such a way that the intoned pattern is similar to the natural prosodic pattern of the sentence when it is spoken. Several children in the present study seemed to be employing a somewhat similar procedure in that singing facilitated their lingual responses. It also seemed that some children did not recognize their lingual, kinesthetic or visual responses as inaccurate until they performed the speech rhythm patterns in the song context.

The simple folk songs and games used in the study were valuable and appropriate contexts for work with speech rhythm patterns. The song-game activities must also be recognized

for their ability to sponsor responses from the children. A study of this nature is dependent on frequency and variety in responses from the children. The selected song-games aided in consistently motivating student responses.

It seems important to note here that the type of music used in this study was song. Therefore, the children were consistently singing, and in turn, producing speech rhythm patterns in this context throughout the project. The aspect of how the children were involved with the music seems especially notable with regard to their constant performance of speech rhythm patterns even though only a few were selected for focus and examination. This continual practice may be comparable to a child's constant use of speech long before being asked to examine specific speech sounds. Having the child, rather than the teacher, an instrument, or a recording, be the source of the sound seems essential for internalization of the patterns of sound to be examined. The child's own singing as a foundation for later work with sound pattern symbolization should be regarded with the same seriousness as speaking is regarded an essential prerequisite to reading and writing.

Visual Responses

Although studies investigating visual aids showed no influence on music learning, the types of aids and the ages of the students in these studies differed greatly from the
present study. It was found that children of all three ages (five, seven and nine) could more accurately identify and follow a prepared symbol than draw their own symbol for the speech rhythm pattern. These results could raise questions regarding the activity of having young children draw their own symbols for the purpose of notating sound. It could be speculated that reading simple sound symbols could happen in the beginning stages of music instruction, while notating the sound patterns would follow much later.

The drawings in the visual symbolization tasks showed apparent developmental levels between the two-year age spans of the children. The five-year-old children frequently drew a picture of an object associated with the word meaning but showed no relationship to the sound pattern. While the seven-year-olds also drew an object representing the word meaning, they were able to arrange the pictures into syllable patterns. Varieties of common notation markings (checks, dots, etc.) were characteristic symbols of the nine-year-olds.

The five-year-old children appeared unable to transfer the hearing of a sound into the drawing of a symbol. For the

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sound of their names, several drew a picture of themselves, and for the sound of "floor (C)," they drew a carpet or rug. Some five-year-olds who did not make any apparent connection to the heard sound or word object drew a picture of whatever they wanted to draw.

It would seem logical to infer that these five-year-olds were not yet at the stage where their visual symbolization of sound is meaningful to their aural discrimination. The problem may lie, however, in the small segment of sound which is being examined. In order to symbolize a syllable pattern, each unit of the sound pattern must be heard and consequently drawn separately. The transfer of this detail from the aural-lingual mode to the visual mode received little help from the inaccurate kinesthetic performances of the five-year-olds. It may have been possible that the individual parts (syllables) of the pattern, hence the pattern itself, were not apparent to these children.

The difficulty that the five-year-olds had with pattern perception was reduced by the presentation of a prepared visual symbol (Ex: neumes--\[\text{\textbf{\textit{m}}}\] , \[\text{\textbf{\textit{m}}}\]). With minimal teacher guidance, the five-year-old children were able to correctly identify and follow (pointing to the parts) the neume symbol for the appropriate word. It may be possible that, for children of this age, the qualities of a prepared symbol show the whole pattern with the intact parts, and that the children's visual recognition of its characteristics
precedes their ability to graphically symbolize what they perceive. The type of visual symbol used seemed to have aided in this recognition.

Non-traditional music notation was used in this study to represent the relationship of syllable stress patterns. In an attempt to by-pass the complex relationships of note-values in traditional notation, the neume symbols were selected to be used in the study. Unlike traditional rhythm pattern symbols, neume notation does not suggest durational relationships between units of the pattern. Therefore, the neume symbol can be used appropriately with a variety of durational relationships within the pattern. In congruence with the primary focus of the speech rhythm patterns and the definition of rhythm used in this study, the neumes show only the number of syllables (number of squares) and stress/nonstress relationships (dark and light squares) of the pattern.

The writings of Gordon and Schafer supported the need to have an alternative notation for children which reflects the characteristics of the sound pattern rather than the arithmetic note relationships. The benefits of such a type of notation for music reading and for musical rather than mathematical performance of the notation were apparent

in the reading task responses of this study. The neume symbols were easily identified and easily performed within the song context.

**Kinesthetic Responses**

Movement in music education classes can be a wide variety of activities (a) for acting out the meaning of the words to a song; (b) for expressively interpreting musical style and phrasing; (c) for performing given sets of rhythms and tones from imitation or notation; and (d) for coordinating beat, tonal or rhythmic motions to a musical piece. For this study, the only movement coded was that used as a means for performing a pattern of stressed and nonstressed syllables. The game activities used throughout the lessons involved a variety of ways for the children to experience this type of movement.

Although the children occasionally responded with gestures using various body motions, most kinesthetic responses were in the form of clapping to a pattern. Studies by Heinlein, Jersild and Bienstock, and Rainbow and Owens suggested that large movements (marching, stamping, etc.) are not necessarily easy for children when the coordination of the movement to music is requested.⁴ Rainbow and Owens

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found that smaller movements (clapping, playing rhythm sticks) were much easier for children to perform than marching to music. A further interpretation of these study results is that the locomotor demonstration of childrens' perceptions are not necessarily as accurate as the finer, axial movements of clapping, snapping, patsching, etc. The present study would tend to support these conclusions.

When the children at each age level had shown a proficiency with kinesthetically demonstrating a sound pattern, two activities in the present study seemed to negatively influence a repetition of this accuracy. One was having the children stand and move to the pattern by jumping, stamping, or similar large movements. Another was instructing them to choose any way they would like to move and show the sound pattern of their name. Using gross motor movements and freeing the choices for types of movement both tended to diminish the accuracy level of performance. Having the children stamp, jump or walk the pattern of a speech sound produced noticeably fewer accurate responses than having them clap, tap or patsch the same pattern. In line with


Rainbow and Owens.
this observation, when the children were asked to make any motion for a speech rhythm pattern, they often chose cumbersome (hence, inaccurate or somewhat accurate) gestures or movements. Therefore, the freedom of movement seemed to take priority over the accuracy of response for the children. The above mentioned conclusions concerning the kinesthetic mode reiterates the questions of which types of movement are best suited for music learning with young children. The children's difficulty with particular types of movements should be considered when movement is used as a teaching and learning tool.

For teachers of young children, it is understandable that variety of movement for experiencial or developmental purposes may be occasionally desirable. It would seem logical, however, to recognize that some types of movement seem more efficient than others for accurate sound symbolization. Therefore, one could question the validity of emphasizing certain types of movement through a teaching tool which cannot in turn be used by the children as an effective learning tool. Children should be offered appropriate ways for demonstrating their own perceptions of musical sound.

Jersild and Bienstock and Rainbow and Owens implied that in evaluating children's musical abilities, the mode of response must be taken into account.\(^6\) The present study

\(^6\) Jersild and Bienstock; Rainbow and Owens.
supports those implications by offering evidence that the children's degree of proficiency and accuracy in symbolizing a speech rhythm pattern was dependent upon the type of kinesthetic response which they chose or were requested to use.

**Lingual Responses**

The lingual mode served a dual role in this study. The technique (speech rhythm patterns) was based in the patterns of speech, but also, speech was seen as a viable means for demonstrating perceived sound patterns. Therefore, separation of the two aspects of speech is difficult, yet some qualification for the two roles is desirable in this discussion.

First, the system and technique of speech rhythm patterns as a structure for perceiving musical sound seems worthwhile in the context of music education. Within the limited scope of this pilot investigation, the researcher observed that the children showed potential ability to transfer speech rhythm patterns to non-song or instrumental music. Patterns were heard and identified in songs through aural discrimination, not through reading traditional notation. The conditions of note-values, bar-lines and meter were not available to impede the purely aural musical focus. Once a sound pattern was identified within a song, it could immediately be performed within the whole song through lingual, kinesthetic and visual symbolizations of its syllable stress
characteristics. This same pattern could then, with little teacher guidance, be found and performed in a new song setting.

The preceding conclusions might warrant a further look at the benefits of speech rhythm patterns as a technique for identifying and performing sound patterns. Although originating with the spoken patterns, it might be possible for children to transfer recognition of these patterns to purely instrumental works. If so, the structures of speech rhythm patterns could provide an interpretive, overt means of performing and expressing the stress pattern relationships in musical sound.

The speech rhythm patterns do seem to offer "concepts for perceiving notes" and "deviation from deadly strictness" in the aural identification of sound patterns. Further investigation would be needed to determine whether or not the ability to perceive these sound patterns could be valuable in reading traditional notation. One could speculate, that proficiency in organizing heard music into a series of speech rhythm pattern structures could also provide the needed organization for interpreting printed symbols into expressively produced sound.

Linguistically, the five-year-old children were more advanced than they were kinesthetically or visually. The

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7Ernest Harris, "Teaching Rhythm," Music Education in Action, edited by Archie Jones (Massachusetts, 1960); Curt Sachs, Rhythm and Tempo (New York, 1953).
seven-year-old children were more advanced kinesthetically than the younger ones, but also remained generally accurate in the lingual mode. Therefore, it seems reasonable to speculate that the lingual mode could serve as a valuable teaching and learning tool for music instruction. Although the Rainbow and Owens and Klanderman studies did not specifically research the lingual mode, a by-product of their research conclusions exposed the efficiency with which three- and four-year-old children could perform rhythm patterns verbally, even though they were inaccurate kinesthetically. These results seem logical when one recognizes (a) the years of experiences the child has in this mode before he enters school, and (b) the inherent qualities of pitch, intensity and duration that are common to both music and speech sound. It appears that the lingual mode may be the most neglected sensory tool for music learning.

It must be emphasized here that the manner in which speech is employed in the speech rhythm pattern technique is not necessarily similar to the typical ways in which speech is used in music materials. The qualities of the speech rhythm patterns are intentionally related to the natural flow of speech sound. Therefore, speech is not

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used as metered chant, written in traditional notation or read from traditional music notation. The general structures of verse rhythm or poetic feet might be comparable concepts for sound perception, yet according to this study the children's names and familiar words tended to be the most acceptable and desirable pattern labels.

The basic structures of the speech rhythm patterns give an organization for perceptual categorization of sounds. The verbal, visual and kinesthetic symbols which demonstrate these patterns need to be tailored for the children with which they are used. A child's name or the word pattern from the song proved to be sufficient in this study for defining a particular pattern. Likewise, the neumes were efficient symbols, yet it may be possible to find similar types of visual symbols which are more quickly and accurately drawn by the children.

The clap/fist motion originally introduced to the children was used appropriately by a few of the seven- and nine-year-olds, but seemed more cumbersome than showing the stress pattern by a strong (stress) and gentle (nonstress) clap (Cc).

**General Comments**

Selecting the most appropriate types of teaching and learning tools according to the group being taught was the core intent of this study; and, the techniques presented were subject to adaptation for the learning needs of the children. The concept
that a teaching approach must be kept flexible was a major reason for attending to the child-suggested and teacher-suggested nature of the responses in this study. In planning the study, the researcher wanted to know the extent to which teacher-suggested symbols for the speech rhythm patterns (the numbers, clapping motions, and neumes) were used by the children. Such an intent was based in the desire to continually allow the children to show what they could do rather than what the teacher could teach them to do.

As the lessons progressed, it was decided that the aspect of imitation as compared to initiation in childrens' responses was too difficult to judge in such a limited time span. Also, the fact that the child-suggested and teacher-suggested classifications were part of the structure for evaluating responses tended to impose an artificial means of response analysis. The lines of imitation or initiation in individual childrens' responses were not clearly apparent. Therefore, the researcher concluded that attention to child-initiated ideas served better in the role of a teaching strategy than as a means for evaluating and classifying responses.

Of particular interest to this researcher was the pattern of behavior from the nine-year-olds which showed the use of explanations rather than sensory demonstrations to show what they perceived. Although the explanation may have been accurate, it did not indicate their ability to perform the
characteristics that they explained. Three reasons may be offered for this developing pattern of behavior.

First, with a multi-sensory approach to language arts, reading, music and other school subjects, the aural mode may be compensated by the visual or the kinesthetic. Less emphasis by teachers on the students' purely aural discrimination of sounds is somewhat understandable because the aural sense is the least concrete, hence the least observable and the least measurable of the other senses. This compensation effect also may actually serve to diminish a student's ability to hear sound patterns by over-emphasizing their symbolization in another mode (particularly visual).

Secondly, the types of sensory tools presented to the children in this study may not have been ones which they preferred to use. Although allowance was made for student-suggested responses, it cannot be assumed that the children took full advantage of this freedom of choice.

Finally, classroom procedures sometimes dictate that explaining about an understanding is more desirable than performing or demonstrating that understanding. In music classes, it is common to witness varieties of performances for musical concepts, through using hand signals, moving to rhythms, singing tonal and rhythmic patterns, and playing patterns on classroom instruments. When the teacher finds it necessary to evaluate the students' abilities in these
same musical concepts, however, a non-performance, sometimes non-aural response is requested from the students.

In one respect group-tests of musical ability are somewhat restrictive, since the circumstances of the testing prohibit any response in sound. The stimulus sounds are heard by all the subjects, but the subjects may respond only by writing their answers in silence. Otherwise, of course, audible responses would interfere with, and thus, influence, the responses and answers of other subjects in the room.9

It seems appropriate to restate some conclusions of the present study in order to speculate on the problems inherent in testing musical ability. Based on information gathered from the present study, it cannot be assumed that accurate measurement of students' musical abilities and perceptions can be determined by allowing only one response mode. In addition, young students' abilities to explain perception and to demonstrate that perception by sensory performance are not mutually inclusive. Evidence was found with each age group of the study that showed a child being able to accurately explain but not perform, or conversely, accurately perform but not explain his or her perception of a sound pattern. This discrepancy occurred in each sense mode, yet would not have been revealed in the quantitative analysis alone.

The quantitative results of the study reflected response tendencies of age groups and individual children and provided

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data which could be statistically treated to determine patterns of responses. The value of collecting and reporting data in this way cannot be neglected. It was found, however, that although group profiles were established and differences could be statistically interpreted, there were individual characteristics and contrasting tendencies which were not reflected in the quantitative results.

Educators should attend to the responses of each individual child in the classroom; therefore, recognizing only the learning patterns of the majority does not necessarily remedy the difficulties in music learning of all children. Basing one's teaching techniques only on research results that are statistically significant would suggest that the other results do not exist. This study would have yielded quite limited (and possibly deceptive) results, if individual differences in responding for each group had not been analyzed. In addition, the results of the study could not be sufficiently and thoroughly reported through the percentage categories alone. The qualitative evidence showed the types, the characteristics and the contexts of the individual children's responses. These aspects of child learning are important considerations for the music educator in offering children appropriate ways for demonstrating their perceptions of sound patterns.
Thinking of the young child as an individual with vivid awareness to the multiple stimuli of his environment and as a growing organism actively engaged with whatever materials this environment affords—manipulating, experimenting, combining, re-presenting, creating—the teacher must of necessity consider both what music does to the child and what the child does with the music.10

Based on (a) the inconsistencies of the childrens' responses from lesson to lesson; (b) the accuracy of demonstrating a pattern in one sense mode but not another; (c) the differences in accuracy of responses with age groups and individual children; and (d) the unique and sometimes supplementary roles each sense mode played in the childrens' musical learning, it would seem imperative to re-evaluate the means by which childrens' abilities are measured. "It has to be accepted that the measurement of musical ability has not yet progressed beyond a rather rudimentary and unsatisfactory stage."11

Many researchers purporting to investigate childrens' musical abilities allow only for non-verbal, non-performing responses. Frequently in testing, children are presented with an item, and based on a purely aural stimulus, are asked to translate what was heard into purely descriptive terms (same/different; higher/lower; louder/softer). The validity of testing childrens' abilities to transform an

10 Helen Christianson, Bodily Rhythmic Movements of Young Children in Relation to Rhythm in Music (New York, 1938), p. 17.

11 Bentley, p. 18.
item from an aural sensation into an analytical, verbal description (with no opportunity to perform and internalize it) should be seriously questioned. Until music education research discovers valid ways to test the aural, performance-based idiom of music with children, it would seem advisable to observe and study systematically the ways in which children respond to the various aspects of musical sound.

Recommendations for Further Research

1. Similar studies with a different population of students would contribute to the information reported in the present research.

2. Similar studies with procedures for coding each lingual response of each student to symbolizing sound patterns would offer more information on the role of this mode in music learning.

3. Studies to investigate the question of which types of kinesthetic, visual and lingual responses seem most efficient and effective for children in music learning could provide insights for appropriate teaching/learning tools.

4. Studies with focus on identifying speech rhythm patterns in non-song (instrumental) music would offer information on the extent to which children might use this technique for recognizing patterns in all types of musical sound.
The primary purpose of the speech rhythm pattern technique as it is used in Education Through Music is to provide a set of stress/nonstress groupings by which melodic-rhythm patterns in music can be perceived, identified and performed. Therefore, a transition is made from recognizing speech rhythm patterns in simple, folk songs to identifying these same patterns in non-song or instrumental works. The lingual mode consequently serves a dual role. It is used as the structure for an organization of sound patterns, and it is used as a means of demonstrating (symbolizing) perceived speech rhythm patterns. Therefore, the lingual mode functions both as a structure for perceiving and a means for expressing musical sound.

In Education Through Music, application of the speech rhythm pattern base to music has included demonstration of this technique through kinesthetic, visual and lingual modes. In this way, the speech mode is at the base of the multi-sensory symbolizations and yet it also is a partner with the kinesthetic and visual modes in demonstrating perceived sound patterns.
The technique of speech rhythm patterns is not intended to invoke conformity or "rightness" in word pronunciations. Rather, it is meant to be a structure for perceiving and analyzing the stress patterns of words; therefore, regional and ethnic differences through stress shift in certain words is recognized and accepted.

The application of speech rhythm patterns (or stress pattern units, language rhythm patterns) in teaching music, often begins with the students' names in order to explore and identify the numerous stress pattern units of familiar words. The number of syllables and the location of the stressed syllable are the points of attention. Eventually, each pattern is given a label which itself reflects the characteristics of the speech rhythm.

To name the various stress patterns found in language we use the numbers as they are spoken in the flow of counting, and the months as they are spoken when reciting the months of the year. It is essential that you understand that the flow of speech is the important setting for each pattern.1

Although the labeling of the pattern is rather incidental to the operation and conceptualization of the sound discrimination, the most functional labels appeared to be the numbers and the months as a relatively "universal" reference point for English-speaking people.

1Mary Helen Richards, Aesthetic Foundations for Thinking—Part One (Portola Valley, California, 1977), p. 34.
Movement is considered to play an important role in learning and practicing the stress/unstress relationships of words and phrases. "When studying the stress pattern units, it is possible to isolate and identify specific patterns by duplicating the sound of the words and phrases through movement." The students are encouraged to contribute their own ideas for "acting out" the pattern through movement, and in this way are exploring the possibilities and appropriateness of kinesthetic sound representation.

It is very important that the movement be performed with the same speed, the same rhythmic relationships and the same stress/unstress relationships that are used when the name is spoken. Our minds furnish that which is missing, the spoken pronunciation of the words. Without the proper rhythm pattern and the proper stress relationships, one's mind cannot hear and complete the spoken sound.

In congruence with the lingual and kinesthetic approach to representation of sound, a notational system is implemented which is a visual guide to the stress pattern categories. Neumes (visual figures) which represent the sound categories apprise the number of syllables and the location of the accent in the pattern.

Appendix B gives examples of twelve simple stress pattern units, their labels, notation and representative words or phrases. Also included are the hand movement possibilities

\(^2\)Mary Helen Richards, Aesthetic Foundations for Thinking—Part Three (Portola Valley, California, 1980), p. 27.

\(^3\)Ibid.
for symbolizing each stress pattern unit. The stressed
syllable is symbolized by the darkened square in the pattern.
This type of visual clue is intended to give information
about the stress pattern group while simplifying the tradi-
tional musical sound symbols. The neumes may be placed on
the staff for pitch suggestions (Ex: ) and may
be read and performed simultaneously with the sound they
represent.

The visual, kinesthetic and lingual symbols chosen to
"standardize" the speech rhythm pattern technique are meant
only as guides for sensory representation; they are not
intended to channel childrens' responses into these forms,
but rather to offer a structure to the teacher for exploring
speech rhythm patterns with children. It is possible that
the most appropriate representative sensory patterns may
vary with different groups; therefore, it must be recognized
that a system of visual, kinesthetic and lingual symbols
may be derived from the students' own responses to speech
rhythm patterns. In this way, child-suggested as well as
teacher-suggested teaching tools are important to the class-
room implementation of the technique of speech rhythm patterns
as described in Education Through Music (ETM).
APPENDIX B

TWELVE BASIC SPEECH RHYTHM PATTERNS--SENSORY SYMBOLS

<table>
<thead>
<tr>
<th>NEUME NOTATION (Visual)</th>
<th>NUMBER LABEL (Lingual)</th>
<th>*HAND PATTERN (Kinesthetic)</th>
<th>EXAMPLE WORDS AND PHRASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>Ten</td>
<td>CLAP</td>
<td>No, Bob, dog, house</td>
</tr>
<tr>
<td>■ ■</td>
<td>Spondee</td>
<td>CLAP-CLAP</td>
<td>J.D., toothpick, football</td>
</tr>
<tr>
<td>■ ■</td>
<td>Seven</td>
<td>CLAP-fist</td>
<td>Robert, maybe, pencil</td>
</tr>
<tr>
<td>■ ■</td>
<td>July</td>
<td>fist-CLAP</td>
<td>Perhaps, Marie, giraffe</td>
</tr>
<tr>
<td>■ ■■</td>
<td>Seventy</td>
<td>CLAP-fist-fist</td>
<td>Marian, beautiful, predicate</td>
</tr>
<tr>
<td>■ ■■</td>
<td>Eleven</td>
<td>fist-CLAP-fist</td>
<td>Milwaukee, banana, the farmer</td>
</tr>
<tr>
<td>■ ■■■</td>
<td>Twenty-one</td>
<td>fist-fist-CLAP</td>
<td>Mary Jane, to the store</td>
</tr>
<tr>
<td>■ ■ ■■</td>
<td>January</td>
<td>CLAP-fist-fist-fist</td>
<td>Watermelon, kindergarten</td>
</tr>
<tr>
<td>■ ■ ■■</td>
<td>Eleventy</td>
<td>fist-CLAP-fist-fist</td>
<td>Identify, Elizabeth</td>
</tr>
<tr>
<td>■ ■ ■■</td>
<td>Twenty-seven</td>
<td>fist-fist-CLAP</td>
<td>Merry Christmas, generation</td>
</tr>
<tr>
<td>■ ■ ■■</td>
<td>Seventy-one</td>
<td>fist-fist-fist-CLAP</td>
<td>All in a day, Jonathan Jones</td>
</tr>
<tr>
<td>■ ■ ■■</td>
<td>Seventy-seven</td>
<td>fist-fist-fist-CLAP</td>
<td>In the beginning, Anna Maria</td>
</tr>
</tbody>
</table>

*For each stressed syllable, the hands are clapped; for each unstressed syllable, one fist gently touches the palm of the other hand.
APPENDIX C

EXAMPLES OF SONG-GAMES USED IN THE STUDY

The speech rhythm pattern which was highlighted within the song appears in brackets.

"OH I KNOW MARY"—(tune of The Farmer in the Dell)

Oh, I know [Mary]
Oh, I know [Mary]
Hi Ho the Derry O, Oh, I know [Mary.]

Description: Any child's name can be substituted for Mary. The name within the song can be accompanied or replaced by a representative motion for the name pattern.

"HICKETY TICKETY BUMBLEBEE"

\[\text{Hickety Tickety Bumblebee}\]

Can you say your name to me?

Description: The child first responds by merely speaking his name. Later, representative motions can accompany or substitute for the name pattern.

For the following songs, any matching word pattern may be sung in place of the word in brackets. Also, each pattern may be accompanied by or replaced by a representative motion for the speech rhythm pattern.
PENNY SONG

There's a penny in my hand, It will travel through the land.

Is it here? Is it there? It will travel ev'rywhere.

CIRCLE LEFT

Circle left do oh do oh Circle left do oh do oh

Circle left do oh do oh. Shake those simmons down.

CLICKETY CLACK

Clickety clickety clack

Clickety clickety clack

Clickety clickety clickety clickety clickety clickety clack.
Here we are together,

Oh here we are together, all sitting on the floor.

There's Mary with Johnny and Johnny with Sally,

Puncinella

1. Oh Look who's here! Puncinella, Puncinella!

Look who's here! Puncinella from the zoo!

2. Oh What can you do? Puncinella, Puncinella!

What can you do Puncinella from the zoo?

3. Oh We can do it too! Puncinella, Puncinella!

We can do it too Puncinella from the zoo!

4. Oh Who do you choose? Puncinella, Puncinella!

Who do you choose Puncinella from the zoo?
APPENDIX D

STUDENT RESPONSE ASSESSMENT FORM
(INITIAL)

Date: 

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<thead>
<tr>
<th>Name</th>
<th>Visual R/NR</th>
<th>Kinesthetic R/NR</th>
<th>Aural R/NR</th>
<th>Numbers R/NR</th>
<th>Nonsense R/NR</th>
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## APPENDIX E

### REVISED STUDENT RESPONSE ASSESSMENT FORM

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**Code:**

**MAPE:**

189
APPENDIX F

Introduction

The following are transcripts of the lessons for the five-, seven-, and nine-year-old children. Only those sections of the lessons which pertained to speech rhythm pattern work are included here.

The names of the children are abbreviated in the texts of the transcripts. A key for the name abbreviations appears at the beginning of the first lesson for each age.

Teacher instructions and responses appear on the left of the page, students' responses are on the right. Parentheses are used around explanatory or descriptive text. All other texts are direct quotes.

The abbreviation "C" is used to designate a clap, and the capital and lower case letters (CC, Cc, Ccc) indicate the stress pattern of the movement. Other movements or gestures are designated by "X" and a description of the movement. (Ex: Xx--patsching on legs). Visual symbols created by the children are reproductions of their drawings. Refer to Appendix C for song materials used.
Names: E = Eric  
Bt = Barrett  
Br = Barbie  
K = Kari  
L = Lisa  
C = Courtney

Lesson #2  Song Activity--"Oh I Know Mary"

(Sang and clapped each child's name in the song and asked them to join in)  
(Not consistently correct at clapping name patterns)

Eric, why don't you take a turn, tell us who you know and show us how their name sounds in your hands when you do it.

Barrett, it's your turn.

You got chosen, Barbie, who are you going to sing to us about?

Kari, who do you know?

Barbie, I'm going to have my hand talk to yours. (Patting on her palm, and saying KaRI (CC) twice)

Let me talk to your hand Kari.  (Patting aLISa on her palm)

E: Barrett (CC singing and clapping. On the 3rd repetition, he clapped several times for the name)

Bt: Barbie (CC singing and clapping correctly in song)

Br: Kari (singing, but clapping several times on each saying of the name)

K: Alisa (singing, but only clapping the 2nd syllable of the name)

Br: Kari (CCCC), Kari (CCC)

Br: Kari (CCC, Kari (CCC)

K: aLISa (3 pats twice on my hand correctly)

L: Peggy (CCC), Peggy (CC)
Discussion

Although in Lesson #2 the children were not consistently accurate, their responses in clapping their names improved. It is difficult to know what part and to what extent the song, practice, and imitation played in this obvious improvement. Each child tended to clap too many times to each name if it were difficult for them to control their clapping. If only one name syllable was clapped, it invariably was on the stressed syllable. Natural response to the stressed syllable was especially noticeable with aLIsa and kaRI because, unlike the other names in the group, the stressed syllable was not first in the pattern grouping.

Song Activity—"We're Going Out on Halloween"

Today, show me your idea in your feet when it's your turn.

E:  ghost (consistently correct—jumping)

Bt:  house (consistently correct—stamping)

C:  Ten supermans (never correct—stamping)

K:  Wonder Woman (close, but never quite correct)

Br:  Twenty thousand Wonder Women (never correct)

L:  One hundred seventy ghosts (never correct)

Discussion

This activity points to the inability of the children to accurately symbolize their verbal ideas by stamping. The one syllable ideas were much easier to kinesthetically symbolize than were the longer speech rhythm patterns. The responses in the activity also indicate a common tendency in classroom situations for the children to be more compelled to explore the possibilities of their ideas than merely to solve the problem that the teacher has set up for them.
Lesson #3  Song Activity--"Punchinella"

As we're walking around, I wonder if you can jump on that last word "zoo."

(Repeated song/activity)

Let's all sit down and sing the song. This time clap on the word "zoo."

(again)

Let's all do it again.

I'm going to do it this time, do it without me.

Put "zoo" on your head this time. K, Bt, C--(correct)

Discussion

Performing a movement simultaneously with an aural/lingual clue does not automatically come easily for these children. The children were more quickly able to clap with the word "zoo" when they sat down than when they were to jump on the word as they moved. Perhaps the element of imitation of the teacher enters into the success while clapping. Also, possibly in imitating the teacher, the children's mimicking caused them to clap after the word. When the teacher removed that model, the children were forced to rely on their aural focus and performed correctly. It is possible that clapping may have been an easier kinesthetic tool than jumping for coordination with the lingual mode. With several repetitions of the song and task, all the children performed accurately.
Lesson #4  Song Activity—"Here We Are Together"

Can you think of another place we could be sitting that sounds like floor? (singing) "all sitting on the (X-snap)"

Does that sound like floor?

(Sang each idea in the song)

Discussion

When asked to find a word to match "floor," the most common answers were those objects in sight in the room. Courtney seemed to be focusing on the initial consonant "f." Recognizing how many varieties of answers are acceptable to the question "what sounds like . . .?" in reading classes, one can understand the track which Courtney's mind could be following.

The song has also now become a context for situating their ideas as Kari and Eric sang the answer in the phrase of the song containing the original word.

Lesson #5  Song Activity—"Mary Had a Little Lamb"

Do you know something else that Mary could have that sounds like (X-clap)?

(singing and clapping kitten in the song) What's the difference between lamb (C) and kitten (Cc)?

Br: lamp
K: (joins in clapping the word)
C: rat
L: cat
K: dog
Br: kitten
L: It has more
Br: It has a second hit
(reviewing words that fit lamb which they had offered) Any others? 

(sing Courtney's idea) Which one of those words fit (C)? 

(singing and clapping-CC) Winnie Which word fits?

Discussion

It is difficult to determine which ideas are offered in an attempt to match the given pattern and which are made merely from rhyming and association. The sequence of answers in this lesson is a good example of the instructional benefit of "wrong" answers.

It seemed to be a common initial occurrence in an activity for the students to offer responses which had more to do with their taking advantage of the freedom of expression than with the intent to match a speech rhythm pattern. This is not unusual and provides a look at answers which come to the children's minds that have not been pre-screened or channeled by the child into a given "correctness." In other words, some children may have been more responsive to "do you know something else (animal) that Mary could have" than to "that sound like the pattern (C)."

Lesson #6 Song Activity--"Bluebird"

Listen. (Hum the tones on 'bluebird') What other bird's name would fit in there besides bluebird?

(sang the idea)

Any other ideas? 

Mockingbird (CCC) 

Eric, can you think of a bird that sounds like (hm-hm)?

(Collect ideas already given and sing in the song)
What's a really big bird?

Does that fit the same as bluebird? Clap baby bird, Barbie.

Now clap bluebird

What do you think, Courtney?

What is it?
(sing Barrett's idea)

Does it fit? (all sing)

(Singing) kaRI (CC), kaRI (CC),
(then singing BLUEbird (Cc),
BLUEbird (Cc)

What is it?

Discussion

The majority of lingual responses in this activity were merely substituting various colors for blue to match "bluebird." The children were able to make comparisons about the number of syllables if they were helped by the kinesthetic (and possibly visual/kinesthetic) clue of clapping. Although previous to his idea contribution, Courtney twice explained to other children that bluebird had two sounds, his recognition of this fact did not monitor his own idea of yellowbird.

In this lesson, several children begin to use the clapping tool on their own to analyze sound patterns. Barrett provided an interesting transition in the lesson by making the connection between the speech rhythm pattern of bluebird to the
pattern of names in the group. Kari, realizing her first name did not fit the pattern, eventually recognized that her last name would.

Song Activity—"Here We Are Together"

(Change the last phrase to "all touching our nose, floor, head, etc.")

I was thinking of things we could touch that sound the same as "floor," "head," "nose."

Let's think of things on us that we can touch, that sound like (C).

Br, E, K: door
Br: core

L: shirt
L: sweater
C: socks
L: all touching our shoes
C: mouth
E: pants
K: eyes
L: ears
C: nose
Br: teeth
L: all touching our hair
(singing)
Br: all touching our head
(saying)
Bt: all pulling our hair
(saying)

(Each idea was sung in the song.)

Discussion

The children were consistently accurate in finding one syllable words to match. After initially trying to rhyme the word, the children were then directed to think of body parts and clothing. The song is also being used as a context for their new word, which puts the speech rhythm pattern back into the musical setting.

Activity—
Making a Visual Symbol for the Speech Rhythm Pattern Of the Words Just Used in the Lesson—One Syllable

The last word in that song sounds like this (C). Think of all those words you came up with and this is what they sounded like (C). With your eyes closed, think of a picture of that sound—what would it look like? It sounds like this, (C), but if you draw it, what will it look like?
C: Somebody sitting on the floor.

Bt: Carpet

E: The carpet with somebody sitting on it.

L: A dog standing with diamonds on her tail (she said earlier "it sounds like a bark")

K: I drew a rug cause it sounded like it. Rug (C). It's a long green rug.

Br: Mine's a water flood, cause this (C) is water.

Show me what you mean, Kari.

Discussion

The responses of the children may have been different had the teacher not suggested drawing a "picture" in the instructions. Certainly, the drawings and the accompanying explanations reflect the students' rendition of the object "floor" rather than the more abstract sound of the speech rhythm pattern.

In reviewing the video-tape of this section it was noticed that Lisa compared the single clap sound to a bark, but this connection to her drawing of a dog was not mentioned in her explanation. Kari seemed to understand the instructions, offered a word similar in meaning and pattern to "floor" and was able to kinesthetically symbolize her visual idea. Barbie's reasoning is unclear for her explanation, unless she did intend that "water" (as she clapped it) matched "floor."

Lesson #7 Song Activity--"Oh I Know Mary"

(Wanted the children to guess whose name might fit the pattern clapped without suggesting any instructions.)
(Singing the song) Oh, I know (Cc).

E: (CCC)
Bt: Eric (sings the name in the song on the last phrase)
K: Lisa
Bt: I thought Peggy
K: Oh, I know Lisa (CC—claps and sings correctly for entire song)
E: Does mine work? (CCC)
Br: And Courtney's
K: Barbie (CC)
L: And Barrett
K: Kari (CC) kaRI (CC)

There you go Kari, do it again.

K: kaRI (Cc)
C: kaRI (Cc)
Br: Ka RI (Cc) Ka RI (CCC)

Watch Kari.

K: ka RI (CCC) xa RI (CCC)
L: ka RI (Cc)

Discussion

Through this song activity the students begin to make the connection between a clapped sound pattern and various names which would fit it. Eric continues to clap too many syllables for his name. Students seem now more at ease using the kinesthetic mode (clapping) to help match lingual patterns. Kari, although inconsistent, is able to match the stress pattern of her claps to the stress pattern of her name.

Song Activity—"Hickety Tickety"

(after singing the song, a gesture was made for Barbie to take a turn, but no mention was made of putting a movement with the word)

Br: Barbie (hit floor once with both hands)
Bt: Barrett (snapped fingers once)
C: Courtney (hit knees once)
L: Lisa (hit head once)
E: Eric (hit head once)
K: Kari (motion resembled accent pattern of name—index finger and thumb together and apart)
(After tapping the teacher's name on each child, so they could feel the speech rhythm pattern)
Courtney, can you put my name on my foot?

Br, on my thumb?
L, on my head
E, on my foot?

C: (he does not respond)
Br: Peggy (XX)
L: Peggy (XXX), Peggy (XXXX), Peggy (XX)
E: Peggy (XX)
L: Peggy (XX-pats on my back)
Br: Peggy (XX-pats on my back)
K: Peggy (XX-pats on my back)

Discussion

Although each child was incorrect in the number of syllables symbolized in his or her name, each did perform the movement simultaneously with the stressed syllable of the name. The accuracy with which the children recognized and performed the names through clapping in the preceding activity did not seem to transfer to the task in Hickety Tickety. Perhaps too many choices of movement (as was given to them in Hickety Tickety) impeded the focus with which they could clap their names. The activity of patting the name pattern on the child seemed to help them be able to, in turn, perform accurately the simultaneous kinesthetic and lingual symbols of the speech rhythm pattern.

Song Activity--"Hello"

(After singing the song)
I have a puzzle for you. There is one person's name that sounds like "hello" (cC) (singing)

Let's try it. barBie (CC) barBie Br: BAR-bie (CC) (singing) Which do we say? C: Eric

Let's see. eRIC (cD) eRIC (CC) (singing) K: I know kaRI (then sings and claps it in the song) Br: kaRI
How about this song. (sang "There's a Penny" song) There is somebody's name that fits "there's a." (Cc)

Anyone else's?

There's a Kari (Cc)

Discussion

Although the children gave incorrect answers when asked to match the pattern of "hello," they quickly recognized the dissimilarity when the idea was put into the song and distorted. Barbie may not have been able to describe why it was distorted, but through the response, "BARbie," she performed the disagreement through her answer. Kari tends (understandably) to be more tuned-in to the unique sound pattern of her name than the other children.

Kari immediately matched Barrett's name correctly to the sound patterns of the "Penny Song." This apparently happened as a response which Kari herself may not have thought about. No mention had yet been made of putting a name to the song, and only the pattern of "penny" was to be the focus. However, Kari accurately matched the name to the melodic rhythm pattern of the entire first two phrases of the song.

Lesson #8

Activity—Reading neumes

(Showed them the X neume and Xx neumes as a puzzle)

This is a puzzle for somebody's name (X neume), and this is a puzzle for somebody's name (Xx neume). You have to figure out whose name is this (X) and whose name is this (Xx).

K: (started singing correctly matching pattern to the melody) Barrett, Barrett, Barrett

C: Barbie

Br: Barbie

Br: Lisa

Br: Barrett

K: See, I told you!

Br: Courtney (Cc, Cc, Cc)

Br: Eric

K: Kari

Br: You! Peggy (saying and clapping in song Cc)
Eric (pointing to squares of neume while saying name)

(After explaining that the black square is louder, the xx neume was displayed.)

We know whose name fits this puzzle (Xx neume). Does anyone in any of your classes have a name that fits this (X neume)?

Which one would be Dana?

Who?

Courtney, you found one!

Discussion

The children had few problems being able to immediately read the visual neumes by tapping the syllable squares as they said the name. Although Kari's name had a pattern different from the others, she easily and quickly followed that neume pattern accurately.

When asked for a (X neume) name, the students seemed to be more prone to thinking of a friend's name and seeing where it would fit than to thinking only of a name which would match the given pattern. These responses could be considered comparable with those others during the study which were more related to the children taking the opportunity to express themselves freely than to match the limits imposed by the teacher. Courtney was able to effectively distort a common name (John) to fit the pattern (Xx), but then immediately corrected it.
Lesson #9
Song Activity—"A Hunting We Will Go"

What else could we catch besides a fox?  
Br: bird!

Something that will fit fox. (C)  
C: Raccoon

We could sing that, but it doesn't fit the same as fox. 
Courtney, could you find something else?

What else?

Parrot (Cc), bluejay (Cc), fox (C), bird (C) See what I'm looking for, Lisa?

Does it fit?  
Courtney (Cc)  
Lisa (Cc)

(Checking with the song, clapping Melanie (CCC)

(Sings and plays game using "bear")

Discussion

The series of responses in "A Hunting" again reflect more the association with familiar animals' names than the channel of one syllable words. Even the correct answers could be lucky guesses with Barbie being the only consistently correct child. Lisa pursued two syllable words and then even offered to change her name to "Melanie" so that it would "fit." It is difficult to determine why the children, and especially Lisa, had problems understanding the pattern requested in this activity, especially because in earlier lessons they were more accurate in finding one-syllable words to fit a pattern. Perhaps the location of the word "fox" in
this song was more obscure to the children than was the location in previous songs which presented the focal word at the cadence.

Song Activity--"I'm Mary, Who Are You?"
(and visual symbolization)

Think of your name and show me how you'd move to your name. Make the sound of your name.

Think of how your name would look if you showed me the sound of your name on paper.

Show me how your name sounds.

How does clap sound and flower?
Why the moon, Lisa?  Cause it's nighttime.

Br: Because they both fit together cause it's clapping (CC). Barbie (CC), I made a hand cause I wanted to clap.

Discussion

Although "I'm Mary" with kinesthetic movement to the name was intended as a preparatory activity for visual symbolization, the speech rhythm pattern was not as much a guide for the student responses as was the chance to do fun movements which were mostly inaccurate for the presented task.

According to the explanations, Kari and Barbie were the only two who attempted to symbolize the sound of the name. Courtney and Eric made a drawing of themselves for their name; Barrett's reasoning is unclear; and Lisa's choices may have had more to do with her interest in drawing the objects than in connecting them to the instructions.

Kari and Barbie both explained their visual symbol by using the kinesthetic mode and Kari attempted to expand her idea by adding a linguistic match (flower/clap). Although she chose an incorrect speech rhythm pattern (flower), Kari displayed an ability to perform and an understanding of the multi-sensory channels for symbolizing speech rhythm patterns.

Lesson #10

Song Activity--"Oh, I know Mary"
(As neumes displayed on the wall were read)

Oh, I know John (singing entire song and pointing to X neume as the name was sung).

Anybody else know somebody whose name is up here?  Br: Eric (pointing to Xx as name was said, then follows correctly to name while sung in song)

C: Lisa (points to Xx; goes back to sit down, then comes back up and points to Xx saying Lisa)
Why do I have black and white on these?

Let's say louder. The black one is a little louder.

I'm going to give you a name and you tell me where you think it fits. Bob

Renee'--it's tricky.

Tom

How about Tommy?

Here's a hard one--Alisa.

You're almost right, Barbie, but I tricked you. (Added XXx neume to ones on the wall.)
Barrett, you're right about how many sounds, but what's the difference in that and the one I've put up for Alisa?

C: Two whites!
Br: I'll tell you why it's Alisa, (following xXx neume, saying a Li sa, stressing second syllable).

Song Activity—"Clickety Clack"

If we had a sign up here for "Clickety Clack" which one would it be?

Br: (Points and sings clickety to Xx neume, touching neume with the first and last syllable of clickety.)
E: (Does the same as Barrett.)
L: (Follows the same as E and Bt.)

Is there one that fits? Let me show you. (Xxx neume introduced) Can you make it fit?

C: Clickety Clickety Clack (follows Xx neume saying one word for each square of the neume).

This is just for Clickety, though.

C: Clickety (follows only the first square of the neume).
L, Bt, E, K, Br: (Each follows the Xx neume correctly saying clickety.)

Where's clack?

E: Clack! (Runs and points to X neume.)

(Followed neumes while singing whole song.)

Discussion

As in the previous lessons, the five-year-olds were almost immediately and totally successful in the multi-sensory reading activities. Although the terms for describing the neume and speech rhythm pattern (higher) may need clarification, the children seemed to have accepted the stress pattern difference; and, with the visual clue, the kinesthetic following with the words was properly stressed with minimal difficulty. Also, the melodic rhythm of the song seemed to be a motivator in coordinating the visual, kinesthetic and aural/lingual skills for reading.
The enthusiasm of the children showed in their desire to figure out new words and what the neume would look like for those words. To encourage this kind of thinking and problem-solving, the teacher occasionally gave a word whose neume did not appear before the children to see if they could imagine what the appropriate visual symbol would look like. The children's responses to neumes already displayed during this type of questioning were not coded in the quantitative portion of the study.

Courtney had a problem in connecting the lingual with the kinesthetic and visual performance of "clickety." It is difficult to know whether the problem lies in his simultaneous coordination of the senses or in his not understanding the nature of the visual symbol for the speech rhythm pattern.
SEVEN-YEAR-OLDS

Names:  M = Matthew
        W = Woody
        A = Andy
        E = Emily
        K = Kim
        D = Donna

Lesson #1

Song Activity--"Here We Are Together"

What else could we touch that sounds like (C) head?
(Sang each idea in song)

I have to ask you about one thing, Matthew. We were finding things that matched head (C), feet (C), knees (C), breeze (C). What happens with shoulder (CC)?

What's the difference between shoulder and head (CC) and (C)?

Put "shoulder" in your hands, Matt.

Say it this time.

Put your "head" in your hand, Matt. Let me show you. (on his hand) shoulder (CC), head (C). What's the difference?

E: knees
W: feet
A: breeze
M: touching your shoulder
K: How about your ribs.

K: shoulder (CC, several times)

D: shoulder (CC, several times)

M: (several taps on shoulder, not speaking)

D, K: shoulder (CC)

M: (several pats on his head)

W: shoulder has 2!
M: shoulder (says and pats shoulder correctly) head
   (says and pats correctly)
M: feet (hits feet together once)
Good, can you think of something else that only has one sound?

(Sang each idea in song)

Discussion

The activity of finding a one syllable word to fit in the song was not difficult for these children, and some also began using the kinesthetic tool of clapping to analyze the speech rhythm patterns. It is difficult to know why Matthew had such problems understanding the nature of the task or the kinesthetic response to the lingual clues, but he did respond accurately once the correct response was patted on his hand and when he spoke the word as he clapped it.

Perhaps for some children it is important to have the tactile experience of a pattern with which they are having problems, and to say the word aloud while they are trying to symbolize it kinesthetically or visually. This initial activity with the speech rhythm patterns of their names showed the vast difference in the skill levels between the five- and seven-year-olds in performing these tasks.

Lesson #2

Song Activity—"I Know Mary"

Oh, I know Matthew (CC) (singing entire song with name clapped). Did you see what I did Matthew?

Sing with me.

Matthew, it's your turn, so decide who you know and put their name in your hands.

Andy, it's your turn.

M: ear
K: heart
D: touching our nose
A: eyes
E: chest

M: I know Matthew (singing, claps entire phrase of song)
K: Matthew (CC, CC)
D: (CC)

(All sing and clap correctly.)

M: Oh, I know Andy.
W, K, D: (CC)

A: Oh, I know Woody (CC) (singing)
D, K, W: (Join in correctly)
Woody, I'm going to change it for you. Don't sing the person's name to us--just clap it, and we have to try to guess who you're thinking of.

(All join in singing and clapping.)

Does Andy's name fit?

Choose, Woody.

Does Matt fit?

Discussion

Although the other children were correct most of the time, Matthew offered consistently incorrect names to match the pattern. He did know that Matt (C) did not fit the pattern even though he had earlier suggested it. The reason for Matthew's tendency in responses in unclear.

Song Activity--"Bluebird"

Instead of singing bluebird--does greenbird fit?

Let's see if it fits in the song. (sang hornet) Any others?

What do you notice about purple?
Discussion

This lesson basically shows the accuracy of the lingual responses to a kinesthetic cue, kinesthetic responses to a lingual clue and the use of the kinesthetic sense for checking the lingual ideas. It also served as a preparatory activity for visual symbolization.

Activity--
Making visual symbols for speech rhythm patterns

Put bluebird in your hands for me. I'd like you to figure out a way to show what that word sounds like. Bluebird has how many sounds? Show me.

W: goldbird
D: bookbird
E: redbird
K: blackbird
D: pinkbird

(Sang each idea)

It has 2 claps. (CC)

Two claps--bluebird (CC)

Two claps

I was clapping hands with 2 claps--that's 1, 2.

That's two hands for two claps.

They're notes.

How many do you have up there? Why?

Three.
Cause you sing it three times. You sing bluebird, bluebird; then you stop and sing it again.

Song Activity--"Ring Around the Rosy"

Now, let's see if you can put the sound of "down" on paper.

He's upside-down.

That's confetti falling down.
Both activities for visually symbolizing a speech rhythm pattern offer evidence of the seven-year-olds' needs to make a figure resembling the meaning of the word or the movement connected with the word. The symbols for bluebird were similar among the students, because they were unsure of what to do. When the first student got an idea (Woody), the others took that idea as their own. Matthew seemed to be thinking of how many repetitions occur on bluebird within the song rather than the pattern of the word. The symbols for "down" obviously reflect the meaning of the word and not necessarily the pattern of the speech rhythm.

Lesson #3

Song Activity--"There's a Penny"

What other money would fit the pattern of penny (Cc)?

K: quarter
W: dime (CC), dime (CC), dime (C), dimey

Oh, that would work, but I don't know who calls it that.

W: nickel
A: dollar (CC)
M: two dollars (CC)
A: two dollars (CCC, checking)

Discussion

Woody's thinking in finding a word to match penny indicated his ability to check his own answer and manipulate the "wrong" answer to make it "right" for the pattern. Matthew's changing Andy's answer ("dollar") to "two dollars" suggests that he does not yet understand the task of matching sound patterns.

Song Activity--"Oh, I Know Mary" (tune)

Oh, I like (CC), and I'm going to clap the sound of my name.

M: (C)
A: (CC)
E: (CCC)
K: (CCC)
W: (CC)
Now, I want you to think of a food you like that has the same pattern as your name. Oh, I like peanuts (CC). It doesn't have to start with the same letter. (sang the song)

Well, let's go on and see if we can think of one you like. (All sang and clapped each idea in the song.)

Did anyone come up with one for Emily?

Discussion

Emily seemed to want a rhyming word for her name or she recognized to a certain extent the subtle difference in syllable length of Emily and pineapple. None of the children except Emily had problems offering a word to match the sound of their names. Although Kim suggested tomatoes as matching Kimberly, no mention was made of the difference in stress patterns at this time.

Lesson #4

Song Activity--"Clickety Clack"

Clap on Clack this time. How many sounds does clack have? One!

Is there anybody's name in here that has one sound? A: Matt (C)

Clickety, clickety Matt (C) (clapping on name).

K: Kim
M: Andy
E: Andy (CC, checking)
M: Woody
E: Woody (CC, checking)
A: I know one! Mrs. Sheehan calls Emily, Em!
E: And (for Andy)
Are there any other words that would be easier to say than clickety?

You're exactly right! That's the same pattern as clickety, clickety, clack

Does it fit? (clapping and singing) fishy (CCC), fishy (CCC), fish (C)

Discussion

This activity was met with enthusiasm, especially when the children discovered the "short form" of their names. Kinesthetic checking of a lingual idea seems especially important to Emily. Matthew remains consistently incorrect in lingual pattern matching. Matthew immediately contributed nonsense words for Clickety Clack. Andy could determine that his idea was not a match, and Kim was able to extend Andy's idea so that it would work properly in the song.

Song Activity--"We're Going Out on Halloween"

For the last time through the song, I want you to put your idea in your feet when we sing it.

Song Activity--"Hickety Tickety"

Move to your names this time any way you want to with your voice or with movement.

M: flippety, flippety, flap (clapping rhythm pattern correctly throughout song)
M: I got one for Woody--Wood!
D: Don
A: And
A: Peg

A: fishy, fishy, fish

A: un-uh (clapping to clickety CCC)
K: fishety, fishety, fish!

W: Frankenstein (XXX)
A: devils (XX)
D: witches (XX)
K: ghosts (X)
E: black cat (XX)
M: dracula (XXX)

M: (hit head X)
E: (CCC)
K: (opened and closed mouth XXX)
D: (hit head X)
A: (clicked tongue XX)
W: (clicked tongue XX)
Discussion

The entire lesson shows the rather consistent accuracy with which the children can symbolize simple speech rhythm patterns kinesthetically and lingually. The fact that the students can, when given their choice of movements, accurately symbolize the speech rhythm patterns of their names, suggests their understanding of the patterns moved beyond that of merely imitating a teacher-initiated movement. Also, it became obvious in the lessons that the more confident the children became with the correctness of their responses, the more they ventured into unique means of symbolizing the speech rhythm patterns.

Kim's increased ability to hear lingual bases in clapped sound patterns was evidenced in her immediate recognition of the teacher's first and last names being combined into a pattern. This was the first introduction to such a word combination.

Lesson #5

Song Activity—"Looby Loo"

This time we can only put things in that sound like (CC).

(Each checked out CC.)
E: put your ear in (CCC)
K: ear (C, checking)
W: ear (C, checking)
D: ear (C, checking)
E: foot (C)
W: foot (C, checking)
E: toe (C)
K: stomach (CC)
A: toey (CC)
D: body
E: put your chin in—
    chi-na (CC)

Is that the way you normally speak it, Em? chi-na? or chin?

E: flower (CC)

Discussion

Emily had difficulty in "Looby Loo" finding a two syllable word (Xx). Even though the other children clapped to check the wrong answers Emily gave, she continued to offer
one-syllable words and kinesthetically symbolize them as two. Andy converted one of Em's "wrong" answers into a "right" one by making it two syllables—(toey). It seems typical that some children may be consistently accurate with a speech rhythm pattern in one lesson or activity, yet be inaccurate with the same pattern in a following lesson.

Song Activity—"Hickety Tickety Bumblebee"

Show me your name however you want.

A: (leg up and down XX)
M: (shoved elbows down to side X)
E: Matt (as she imitated Matt's motion and figured out which name he was symbolizing)
D: (whistled XX)
K: (with finger XXX)
E: (hit head X)
A: Em (verbalizing the name Emily had symbolized)

But my name's Peggy Bennett

K: But you said (CCC)—that's only Peggy Ben

I know, I was saying my first and second names—Peggy Dee.

Oh . . .

Discussion

The kinesthetic responses in "Hickety Tickety" were all correct while the children used a wide variety of ways to move to their names. This activity showed the children being easily able to convert sound to kinesthetic symbol and kinesthetic symbol to sound, especially in a new setting with the teacher's name. This ability was especially obvious when the contributions were less imitational—as in the unique body movements and "new" name combinations for the movement.

Activity—Listening for the difference between the Xx and xx stress patterns

There's something different about Michelle's name and Matthew's name.

E: They both start with an M.
Listen--(cC)--(Cc). Did you hear the difference?

D: One goes low and one stays high.

A: The first part of Michelle's name is slow and the second part of Matthew's name is slow.

You're right, but instead of slow, let's use the word softer. We don't say matTHEW (cC). They're exactly opposite.

Discussion

Donna and Andy seemed to have an idea of the comparative qualities of the two speech rhythm patterns without having the most efficient way of describing them. Emily heard most obviously the common initial consonant "M."

Activity--Matching Names to Neumes

I need you to tell me whose name that is (X neume).

Whose name could it be?

Why?

Why do you think so?

You think Andy is shorter than Donna? Clap them for me.

How would it fit?

Why don't you write that up here, Kim?

Does anyone else have a name in here that would fit this (X neume)?

A: mine

D: mine

W: mine

K: What are we doing? How can we guess what name it is?

A: That one's Donna (points to Xx neume).

M: (CC)

A: Because it's long and Donna's name is long. That one I thought was mine (X neume), because my name is short.

M: (CC)

A: Andy (CC), Donna (CC)

K: How about Kimberly (CCC)?

K: Kim (C)

K: (writes on a sheet of paper hanging under the neume)

E: Emily (CCC, checking)

M: Matt

D: Don (C)

E: Em (C)
I need to get another one (neume) because there's a person in here whose name doesn't fit either one of these.

What do you know about the sound of Woody and the sound of Granville?

E: Woody!
W: Un-uh, cause I'm using Granville.
M: Woody (CC), Granville (CC) It would be under the one with two.
E: Oh, Peggy . . . Peggy (CC) or you could put yours here (X neume), cause Peg (C), Peg (C)

Discussion

It is difficult to know whether the children were thinking of their "shortened" names (And, Wood, Em) or were simply eager to have their name fit, when they responded to the X neume. Although Andy's hearing his name as being shorter than Donna's may be valid aurally, the pattern of syllables makes them the same length; and, Andy discovered this when he clapped the two names.

Emily's and Woody's responses to the need for a new neume pattern are interesting. Emily thought Woody's name did not fit the X or Xx patterns, and Woody seemed almost to signal agreement by announcing he would be using Granville (his real name) and not recognizing the common speech rhythm pattern of the two names.

Lesson #6

Song Activity--"We're Going Out on Halloween"

This time, when you sing your idea, everybody move to your idea--put the sound of the words in your movement.

W: Dracula (moves toe in shoe correctly)
M: Frankenstein (flaps elbows XX incorrectly)
D: Witches (flaps elbows XX correctly)
E: Ghosts (CC), ghosts (C)
K: Devil (jumps XX correctly)
W: Dracula (jumps XX incorrectly)
Woody, how many sounds does Dracula have?

Okay, put it in your hands, Matthew.

Now jump.

Discussion

Although the first time this task was presented with this song (Lesson #4) they were correct, both Woody and Matt needed to clap the pattern of their idea in order to jump it correctly. For this instance, it would seem to be more efficient and accurate to symbolize sound through clapping rather than through jumping for these two boys. Perhaps clapping was more familiar or jumping was too cumbersome for accurate performance of the speech rhythm pattern through movement.

Activity—Matching Words to Neumes

Where does this list go?
(Xx words) (having the students decide which neume matches words)

E: (reads names and claps CC in order to decide)
Granville (CC)

How about this one?

E: On the three--Emily (CCC); Kimberly (CCC)
W: I need to write my other name--Woody.

E: Woody (CC) Two
W: I know!

Where would it go?

Emily, I want you to figure out where your last name goes?

E: penny (CC)
W: penny (CC)

Kim, I want you to figure out where your last name goes?

K: (correctly identifies Xx neume)

Emily, I want you to write penny.

Donna, what's your last name? Do you know where it goes?

D: Chamberlain
D: (correctly identifies Xxx neume)

Think of an idea and where it goes with the sound.

(most clap with the word before writing it)
Do you know where it goes? W: I want to do my other name--DePoy.

You have such good ears because you know which of the two sounds is stronger. W: DePoy (cC)

Which is it, Woody? W: The second one.

I'll add a new one. What will it look like? M: two whites

The black one tells which is stronger. D: white/black

Clap it for me. (xX neume) (many practices of cC to xX neume)

Which of the two places will it go? D: Charlene

K, D: (cC and Cc several time to check where Charlene should be written) D: This one (xX neume).

Do Joanne for me, Kim. K: Joanne

Discussion

The reading activities with the neumes give an indication of the importance for the children of saying the words aloud, checking the syllable pattern by clapping and then clapping the stress pattern of the neume to match it correctly with the word. The kinesthetic mode seems especially necessary for Emily as she rarely figures out a pattern without having to clap it first.

The activity focus on DePoy (xX) seemed to trigger Donna's and Kim's suggestion for Charlene and Joanne. This could have been their lingual matching to the sound pattern, but because it was difficult to substantiate, was not coded as a lingual match.
Lesson #7

Song Activity--"Kitty Casket"

What does the song say I found yesterday?

Think about the word handkerchief for a minute

Do you know any other words that would fit there?

(sang Adny's idea in the song)

Does it fit?

Discussion

Woody's response of "kitty-cat" was not heard by the teacher during the lesson, and it was obviously a lingual match to "handkerchief." Woody's listening was also discriminatory when he noticed the subtle difference between handkerchief and pineapple and tried to explain what he heard. Kim knew "tomato" had three sounds as "handkerchief" did, but also recognized its distortion when put into the song.

Song Activity--"Clickety Clack"

Why does flack fit in there where clack does?

A: It has the same amount of letters.
It has the same amount of syllables or sounds, Andy, the same pattern.

Who else in here has the same pattern as Matt:

Who has the same pattern as Peggy?

Andy, do you know somebody in this room, whose name will fit these (Xxx neume).

Let's see if it fits.

Emily, Emily Clack (singing Whose name in here fits the pattern of clack?)

Emily Emily Matt (singing)

Anyone else's fit this pattern (Xxx neume)?

Oh, for clack.

But Matt doesn't fit clickety. There's a way to do it though. What else fits clickety?

And what's your idea, Donna?

Our song is--Emily Emily And Kimberly Kimberly Matt Chamberlain Chamberlain Chamberlain Chamberlain Chamberlain. Is there anyone's name we haven't used? W: Wood!

Discussion

Rhymes still provide a major transition influence for finding similar speech rhythm patterns, and frequently the
children are able to demonstrate an understanding which they are not able to describe.

The children were enthusiastic about fitting their names into "clickety" and using various forms of their names to get the proper pattern fit. Although certainly other word labels could have been used from the beginning of the study for the speech rhythm patterns, it is unlikely that any other words would have provided as much intrigue for the children as their own names.

**Lesson #8**

**Song Activity—"Row Your Boat"**

Does anyone know any other words that fit with merrily?  
K: Emily (CCC), merrily (CCC)

Any others?  
M: Penny, no wait (CC, CC kept checking)
D: Kimberly

**Song Activity—"I'm Mary, Who Are You?"**

Visual Symbolization of Names

I want you to show me your name instead of singing it to me. I'm . . . who are you?  
Figure out how to show the sound of your name right there on paper.

E: (kept saying and clapping her name)

E: I did Em (C), Em (C) and I put an M for Em (C), and I put three 3's for Emily for three claps.

A: This stands for And and 2A stands for And drew and the other one stands for Andy.

M: One is for Matt.
D: I drew one clap.

W: for Don
D: for Don
K: Three claps for Kimberly.
I'm going to give you a new word and you try to show me the sound of this word—library.

W: It's my voice saying Woody. It's my mouth there, and the vibrations are saying Woody.

E, W, A, D: (CCC)

M: See, you can go li (C) and you can go li - brar (CC) and you can go all the way down to ten.

A: This is three books for library.

E: These are three books for library (CCC).

K: He's clapping library (CCC).

W: A person saying li - brary.

D: library (CCC)

Next word—Happy Birthday

E: (clapped many times to practice the word)

M: Happy birthday; then you can go "happy birthday to" then happy birthday to you.

D: 1 1 1 1

E: These are for happy birthday (CCCC).

A: This is for happy birthday and this is for happy birthday. Those are supposed to be presents.

K: Happy birthday (as she points to the candles and says the syllables)
Discussion

The majority of visual symbols and accompanying explanations represented a figure (picture) of the word meaning and a number of symbols which apprised the number of syllables. Woody was more concerned with his knowing that the sound of a word is vibrations than writing speech rhythm pattern symbols. Emily continued to rely on the kinesthetic mode to analyze the lingual. Matthew's ideas were linked to a previous activity in the lesson. He had learned to sing "Row Your Boat" by dropping the last word each time through the song and then reversing the process. This intrigue with the sequential addition of words to the song resulted in his preference for visual symbolization.

Lesson #9

Activity--"Haunted House" (recording)

(after listening to the main theme)

Can anybody sing to me what that sounds like? A: dorsey, dorsey, dorsey, dorsey

Do you remember how the melody goes; can you sing it to me: K: I'm a little teapot short and stout, Here is my handle, here's my spout (singing).

See if Kim's right. Listen for the part of the song. You tell me where those words fit. K: (sings appropriately with the music)

Discussion

This activity was intended to see whether or not the work with speech rhythm patterns would transfer to hearing speech rhythm patterns in a purely instrumental example. Both Andy and Kim responded with matching words, and Kim heard a pattern to which she sang a familiar song. Although the selected melody did not closely resemble the melody of "I'm a Little Teapot," the word patterns fit exactly to the melodic rhythm pattern of the recording.
Activity—Reading Neumes

Who can read this to me (X neume)  
M: (C)

Somebody else read it in a different way.  
A: (tongue click)  
K: (smacked lips)  
D: (whistle)  
W: (tongue click)  
E: (blinked)

Okay, can anybody think of a word that you could read to this?  
A: And (pointing to himself in synchrony with the word).  
K: worm (C)  
D: Don  
W: Matt

Who can read that one? (Xx neume)  
D: Donna (Cc)  
W: Woody  
D: (Cc, Cc)  
M: Mathew (Cc, Cc)

Why did you do it that way, Matt?  
M: two claps

But you did them differently; why?  
D: (Cc, Cc, Cc)  
K: Because this is the louder (C) and this is the softer (c).  
A: Andy (Cc)

One more--this is a hard one. (Xxx neume)  
D: That's simple  
E: (breathed three sounds)  
D: Emily (Ccc)  
M: John (CCC)

John?  
E: John (C)  
M: John (CCC)—it's three.  
A: He's saying J-oh-n (CCC)

When you're talking to John, do you say J-oh-n or John?  
E: John (C)

Discussion

The activity of reading neumes was intended to illustrate the varieties of sounds, movements, and words which can be read from the visual symbol. When the neumes were presented to be read by the children, no request was given for any particular response mode. Each of the children chose a
kinesthetic or a kinesthetic/aural response initially but easily supplied a matching word (usually a name). Matthew was listening to each phoneme rather than the natural pattern created by the speech sound; and, possibly he has still not been able to understand the nature of the speech rhythm pattern tasks.

Lesson #10

Activity--"Haunted House" (recording)

(sang the main theme on "la")

I think there are some names that would fit on there. What would fit on la la la (singing)?

How about Kim, Kim, Kim (singing). Listen to the groups of two . . . (sang lala lala lala)

I think I'm going to put a food in there--let's see. What food sounds the same as Andy's name.

(sang in the melody)

What food sounds like la la la (singing)?

Let's sing it.

Sing whatever words you want to this time.

Discussion

Much teacher leading occurred in this lesson, but it is included here to illustrate the facility with which the
children are able to make lingual performances of sound patterns—both with familiar words and nonsense syllables.

Lesson #10

Activity—Following Neumes

(On the wall the neumes for X; Xx; xX; Xxx; xxxX; xxxX appeared)

Let's sing Punchinella. Does anyone see the pattern for Punchinella up there?

Andy, if we sing the song, can you follow the words, touching the pattern? (show him once singing the song)
Can you do it that fast?

Sing Clickety Clack

(While the preceding activity was still going on, M goes to the neumes and begins reading them with the clap-fist motion; most of his clapping was correct.)

W, A, E, K, M, D: (all start clapping and saying Punchinella to figure out how many sounds are in the pattern)

A: (points to xxxX neume)
D: (points to xxxX neume)

A: (followed two times correctly—second repeat of the word is difficult)

Wippety wippety wap (immediately changed the original words to the song)

K: I know one—Emily Emily Matt (sings whole song with these names)

Who can find Emily or Clickety or wippety?

Who can find Clack?

Matt, where is it?

Okay, you point to that every-time we sing clack; Kim you point to clickety.
Sings "Oh Here We Are Together"

Where's together?

There are three choices up there with three sounds— which is it?

Together, Together Clack (singing "together" to clickety tune, intentionally distorting the word)

Emily, you do "together;" Woody, you do "floor."

Which one is that?

Discussion

This lesson shows the children reading and analyzing the speech rhythm pattern in a variety of ways. The song has provided the temporal context for performing the speech rhythm pattern through reading (following) the visual neumes and the reference point for checking the correctness of a matching lingual pattern. Kinesthetic reinforcement and analysis continues to be an important tool for problem-solving in speech rhythm patterns, especially for Emily.
Lesson #11

Activity--Identifying Neumes

Someone point to Punchinella for me?

A: (using clap-fist motion to figure)
D: (points to xxx neume, says Punchinell, Punchinell, then goes on to xxxx neume and says Punchinella)
A: Punchinella (pointing to xxx)
E, W, M: (follow and say correctly)
W: (follows with foot from the floor)

Activity--"Bolero" (recording)

Listen to this. What do you hear?

Let's listen closely, because it's very quiet.

Listen and see if you can remember that sound--it keeps repeating over and over--Can you play that sound on your drum"

Can anybody say to me how the sound goes? Pom . . .

Let's do it (rhythm pattern) on our knees.

You know what--there is a pattern in there that you know. Think of some words that would go on it. Pom ppp pom.

Where does clickety go?

K: footsteps
K: a band
A: It sounds like palm trees going back and forth.
(all pat an imaginary drum in front of them, but none are accurate with the rhythm pattern)
A, D, K: (sing on nonsense syllables)
M: It sounds like army men walking.
(none were accurate)
E: Cinderella dressed in yella (patting thighs on beat)
E: Emily (hands on knees XXX)
W: clickety
D: Donna Chamberlain
K: click clickety click click
Let's all sing it the way Kim did. When you hear clickety, sing it with the music. (tempo was too fast for most to coordinate with singing)

Discussion

Donna's response in the first activity is noteworthy as she reads the neume aloud in order to find the appropriate visual symbol for Punchinella.

Listening to "Bolero" brough programmatic ideas from the children initially as they were asked what they heard. Perhaps the piece was a poor choice by the teacher for having the children match speech rhythm patterns, but it did display the difficulty with which the children performed through movement and the ease of their lingual performance of the melodic rhythm pattern of the piece.

Lesson #12

Activity--Matching Visual, Lingual, and Movement Symbols to an Instrumental Pattern

I'm going to play a pattern for you on the recorder. You'll hear the same pattern repeated all the way through a song. Just write in the space there which pattern you hear.

(Four items are given, each is W: played on recorder to the tune of "Scotland's Burning" but the speech rhythm patterns vary with each item. 1 - Xxx; 2 - Xx; 3 - xxxXx; 4 - X.)

K: (whistles pattern for 1) W: (sings momma, momma for 2) D: (hits feet on floor to patterns) K: (pats patterns on knee)

<table>
<thead>
<tr>
<th>Visual Symbols</th>
<th>Explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td>E:</td>
<td>It's a track like horses clopping.</td>
</tr>
<tr>
<td>D:</td>
<td>It's a track.</td>
</tr>
<tr>
<td>K:</td>
<td>(singing melody with the pattern and following the marks to the music)</td>
</tr>
</tbody>
</table>
Because it was going loud soft soft.

The same thing that Andy said only it's vibrations.

Well, when it went higher and lower, I went da-da-da da-da-da (singing the tune, did not match with the visual symbols)

... 2 - Xx

dribble, drabble, dribble, drabble (singing)

I made like lightning striking

I did loud-soft, loud-soft (visual did not match this)

It's the same thing as this one (pointing to l). It's soft-loud-loud.

K: loud loud loud (singing)

so-mi so-mi (singing melody)

Mine's Frankenstein walking like this (gets up and walks like a monster).

Franken, Franken (singing)

Discussion

As the items were being presented aurally, Woody, Donna, and Kim were seen using various sense modes during the hearing of the items to identify or practice the pattern. Woody seemed easily and quickly able to hear a familiar word in a musical pattern, but because his answers were often mumbled
or quiet, they were not heard by the teacher and were discovered only when the video-tapes were examined.

In the first four items, explanations were only asked of the children for number 1 and number 2 because time did not permit a longer discussion. None of Emily's visual symbols represented a recognition of a speech rhythm pattern in the musical sound pattern. None of Donna's visual symbols resembled a speech rhythm pattern, although her explanation of number 2 seemed to indicate her accurate perception of this pattern. Kim's symbol for number 1 did not delineate the sound pattern, but her following of the lines as she sang the song showed her accurate performance of the pattern to the visual symbol. It is possible that her explanation of item 2 was affected by Andy's singing the pattern incorrectly (as a XXX) just before her turn. Andy was able to accurately symbolize, explain, and sing the pattern for item 1 and sing by attaching a matching lingual label to the pattern of number 2.

Although Woody seemed to hear the pattern accurately and express it lingually, the visual symbols he chose do not reflect this perception. Matthew's explanation and non-sense syllable performance of the pattern in number 1 is not reflected in his visual symbol; and, although he may have been connecting the pattern of number 2 to the kinesthetic image of walking, this perception was unclear both in his visual symbol and his explanation. Woody immediately and accurately put Matthew's idea into the pattern by singing "Franken, Franken."

All the children seemed to draw symbols which were more remote from the pattern as the activity progressed. It is unclear why this lack of definition occurred.

Activity--"Making a Visual, Lingual and Kinesthetic Symbol for an Aural Pattern"

Remember the patterns we had on the wall? You're each going to get your own pattern, and whichever one I give you, you try to show me on number 5.

(Patterns are given individually, W-XX; D-xxXx; E-XXX; A-XXx; K-XXX; M-XX)
Now I want you to show me a movement that goes with your pattern on number 5, and then tell me a word that sounds like it.

W: (tongue in and out) Woody
D: (legs on floor, bounced correctly) Donna, Donna (singing)
E: (hand gesture--incorrect) Emily
A: (opened and closed mouth correctly) Andy Gilbert
M: (circles with finger--not to pattern) six
K: (three shakes of leg) Kimberly and line, line, line

Discussion

Item number 5 displayed the students' abilities to be generally accurate in their kinesthetic and lingual symbol of an instrumentally presented pattern. Only Matthew was incorrect in both the kinesthetic and lingual modes.

This lesson and activity served to further illustrate the inefficiency of the visual mode for children's expressing their own symbol for speech rhythm patterns. With all children, much more proficiency existed in the kinesthetic and lingual responses to speech rhythm patterns in musical sound.
NINE-YEAR-OLDS

Names:  Je = Jeff  
        Ma = Matthew  
        S = Scott  
        Mi = Missy  
        Ji = Jill  
        L = Lisa  

Lesson #1

Activity--Clapping sound patterns of names.

Who is this (C)?  
S: Clap?  
Ji: Jill?  
S: Jeff!  
Jeff (C), Jill (C)  
Who else could it be?  
L: Matt!  
Matt (C)  
L: Scott (C)  
Listen to all the people in here whose names sound like (C).  
Mi: (C)  
What does yours sound like Missy?  
Mi: (CC)  
What's the difference between yours and Jeff's?  
Mi: Well, it goes like Miss-y.  
Mi: It has two syllables.  
Ma: Ma-thew (CC). Listen to Mr. Duffy. Mr. Duffy (CCCC)  
Show me your name, Lisa.  
L: Lisa (CC)  
Can you clap it as fast as you say it?  
L: Lisa (CC)  
Mi: (CC)  
Ma: Matthew (CC)  
How about you?  
Je: Jeff (C)  
S: Scott (C)  
Ji: Jill (C)  
Mi: Missy (Cc)  
Ma: Matthew (Cc)
Discussion

This first lesson showed the 9-year-olds having very few problems with the activity of clapping the syllable patterns of their names. This, as a beginning experience for this study of symbolizing sound through movement seemed to take little time for the students to understand. It was interesting to note that a majority of the time, the students spoke the name as they clapped it.

Activity—"I'm Mary, Who Are You?"

This time, when you say your name, clap it while you say it in the song.

(Each claps correctly.)

This time, instead of clapping, think of a sound to say your name. Think of a sound that has the same sound as your name.

L: I don't know what to do.
Je: I don't understand.
L: I'm "mmm" (only one syllable)
Je: I'm (X-stamped foot on floor)
Ma: I'm "hatch-EW" (acted like sneezing)
S: I'm bad.
Ji: I'm (X-snap)
Mi: I'm (Xx-clicking her tongue)
L: I'm (Cc)
Je: I'm (Xx-knocking fist on wall)
Ma: I'm (Xx-hitting fists on chest)
S: I'm (X-sound with lips)
Ji: (C)
Mi: (XX-mouth sound)

Discussion

This was quite a "jump" from the first activity of clapping names. Once the students understood the question and some possible responses, they had little trouble. It was noted, however, that the presentation of a new and unique idea occasionally took precedence over matching the sound patterns of the students' names. By inserting the name into the song, the students also were being asked to fit their idea into the temporal framework of the song phrases.
Lesson #2

Activity--"Circle Left"

What other word fits in there besides "left"?

Hum the song to me. Now hum only the words "circle left" and sing on "do-oh, do-oh." What other activity fits the same pattern as (humming pattern of "circle left") when you put words to it?

(Singing) "Clap hum hum"—we need something else in there to fit the pattern.

What are you clapping:

Will that fit? (singing) Clap your hands?

Let's all sing Lisa's idea.

Any other ideas?

We have a decision to make. We're trying to match "hm, hm, hm" and we just got "snap your fingers." What do you notice?

What is different?

You're right. Jill, it's a perfectly good idea—it just doesn't exactly match "hm, hm, hm," but we can put it in the song anyway, let's sing.
Discussion

The students have little problem matching one syllable words to "circle" in the beginning. This, however, is not necessarily an indication of their understanding of word patterns, but could merely indicate a result of their word association—left, right, up, down.

Lisa and Matthew both relied on the kinesthetic tool of clapping to help solve a lingual problem of matching speech rhythm patterns. When Jill offered a pattern that did not fit, Scott immediately knew and Lisa used movement to come up with the explanation of what was different about Jill's idea. Although minimum emphasis to this point has been placed on figuring out a word pattern by clapping or other movement, at least 3 of the students seem comfortable and efficient with this tool for speech rhythm patterns.

Lesson #3

Activity—"Oh, I Know Mary"

Think of a person's name, and how you'll make the sound of that name fit in the song, "Oh, I Know ____"

Ma: Oh, I know "poot" (all sing, Ma chooses)
Je: Scott?
Ma: No
L: Jill?
Ma: right

Lisa, it's your turn.

OK, come here and whisper it to me.

We need to do that again. When Lisa clapped it, she did (Cc), but when some of us clapped it, we did (CC). Let's try it again.

Missy, it's your turn.

I need to ask Missy a question. Do we say the person's name like this (CC) or like this (Cc)?

Ma: Oh, I know Mary
(all sing, Ma chooses)
Je: Scott?
Ma: No
L: Jill?
Ma: right

Ma: Missy
L: Yes
(all sing, only Lisa and Matt clapped name while singing)

Mi: I know (XX—opened and closed mouth).

Mi: the second one
(all do and sing)
Ma: Matthew
Mi: No
Je: Jeffrey?
Mi: No
Discussion

Introducing the component of stress, the teacher begins to emphasize the importance of making the movement match the natural flow of the pronunciation. The students have no problem differentiating between the one and two syllable patterns of their names.

Activity—Making a Visual Symbol

When we say Scott's name, there are all kinds of ways to move to it that SOUND like his name sounds. If you made with the marker, something that sounded like your name, what would it look like? A sound that looked like this (C), so that if we looked at that mark we'd know it's your name. Everyone think of one for your name. Make a mark that looks like the sound of your name.

Matt, show me your name in your hands. Ma: I know

Ma: (CC)

Ma: (XX-on head)

Show me on your head

Now show me what it looks like. Ma: I know another one—hee haw! (he then draws the words hee-haw, claps the name and draws a picture)

Even though Ma drew a picture, yours doesn't need to be; just a mark for the sound of your name.

Yes, if that's what you want to do—if it looks like the sound of your name.

Why does that look like the sound of your name?

Ma: (continued to say Hee-Haw)

Mi: What do you mean by a mark? Just like a check?

Li: ♦ ♦

Li: Because it's two claps.

Mi: ♡ ♡

Je: △
Discussion

By introducing the teaching tool of visual representation of sound, the teacher intended to move from what had already been determined—the movement to the sound of their names—to ways they could show visually what they knew. Once they understood what was being asked, they relied on common visual symbols for sound representation.

Song Activity—"Punchinella"

Sing the song, but hum on "Punchinella." Now, Punchinella is a pattern (humming xxxx) and what word or phrase would fit in there just the same as Punchinella?

It has four syllables—what word would fit just the way Punchinella does?

(singing) Oh, look who's here Missy Hum hm--we need more sounds in the pattern.

Oh, what's your last name, Missy?

Let's see if it fits—(sing) does it?

What else?

(sing in song) How about from the school—that'll work.

What are you saying Matthew?

S: And it has four syllables.

S: Missy?

Je: You could put somebody's first name and last name.

Mi: Miller, Missy Miller, Missy Miller (singing) (Yes)

Je: Jeffrey Tucker

Je: But I'm not from the zoo.

Ma: Oh, look who's here Rockarella (singing entire song)

Ma: Rockarella
Let's sing it. Did you just make that up?

Oh, look who's here, Matthew Kratz (singing). What happens to that one?

How could we fix that?

That doesn't fit either. Are there any other words you know that fit in there?

Scott already said that Punchinella has four syllables. One of them--just one of them--is louder than the others. Figure out which one it is.

Which one—(Cccc)(cCcc)(ccCc) (cCcc) (ccCc) (cccC)

OK, is it (Cccc) PUNchinella?

Which one do you vote for, Missy?

Number 2, punchINella (cCcc)

PunchINELLa (ccCc)

Ma: Yeah
L: Oh, I know--Matthew Kratz.

Ji: It only has three syllables, not four.

Ji: My last name has four syllables, so I'd have five syllables. Too many.
Ma: Matthew Eli Kratz (singing tune of Punchinella) Oh . . . (realizing it did not fit).

S: Crackerella, Crackerella (singing) (all sing)

Je: The first one.

Ji: That one.
Ji: That one.
Je, S, Ji: That one!

Ji: Punchinella
Mi: Ruh-uh, PunchiNELLa

Mi: The first one. PUNchinella
L: (CCCC)
Ji: (CCCC)
Ma: PunchiNELLa, PunchiNELLa (singing)
Mi: Well, I know it's not Punchinella.
L: No, number 2, number 2!

Ji: No
Ma: PunchiNELLa, PunchiNELLa (singing)
L: Number 3, number 3!

Mi, S, Ji, L: Yea!
Put it in your hands (singing the song).

L, Ji, Mi, S, Ma: (none claps correctly with the word)

Discussion

In this activity it became obvious that several students were approaching speech rhythm pattern by cognitive analysis (how many syllables in first and last names) rather than relying on their aural judgment. Matthew came up with a rhyming nonsense word which fit. He will happily offer any idea he has and then figure out if it works while others may tend to "work it out" on their own first and offer an idea only when they come up with one they have already determined to be correct.

It seems extremely difficult for students to decide where the stressed syllable is when they are being exposed to this question without prior training. By singing the word in the context of the song rather than merely speaking it, the stress is "frozen" in the pattern and much easier to detect.

Activity--Making Visual Symbols

Now, here's what you have to do. You know that this (pointing to the visual symbol that Scott made earlier in the lesson) is Scott, and we already figured out about Punchinella--what is Punchinella going to look like? The sound of Punchinella . . . you know something about that third sound, too. Let's see what you come up with.

Why did you do that?

L: \[ \mid \mid \mid \mid \] (name)
L: (points to marks with finger, saying Punchinnella)

Mi: \[ \bigstar \bigstar \bigstar \bigstar \] (name)
S: \[ \checkmark \checkmark \checkmark \] (name)

Je: Do you have to put the four syllables in?

You can do whatever you want as long as you show the sound for Punchinella.

Show me why you did that, Matt. Ma: Because, "look who's here (singing) punch (throws a punch) inella"
What did you do?

I'm going to do one now that you've all had your turn.
Here's my Punchinella (drawing the xxxXx neume). Tell me why I did it that way.

You're right Scott.

And my name will look like this (drawing Xx neume).

Discussion

Students were able to accurately represent the syllable pattern of their names and a familiar word by using symbols which were common to them. Only Matthew attempted to show the meaning of each syllable of "Punchinella" in his drawing. In many ways his symbolization is closer to the seven-year-olds' symbols than the nine-year-olds'. These children also were immediately able to see their symbol as a representation of sound which was demonstrated by their following the symbols as they pronounced the syllables.

Lesson #4

Song Activity--"Punchinella"

What we're going to do is sing the other words that fit Punchinella while we play the game--who's first? Missy?

Another idea?

(sing each idea in song while playing game)
Yes, but we don't want to ruin his last name. It's just Kratz (C). What's your middle name?

Ma: Eli

Let's see if that fits—
Matthew Eli.

Discussion

Using nonsense and rhyming words again, Matthew is able to match the pattern. The idea of rhyming is continued by Scott when Lisa suggests Matthew's name, but this operation (rhyming--Kratz, Fatz) is found not to work for all suggestions in this activity. Missy figures out what needs to be matched and distorts the name to fit a four syllable pattern. Such a response indicates an initial understanding of pattern matching.

Lesson #5

Song Activity--"Here We are Together"

On that word "together," show me how it looks in your hands.

The thing I noticed about your clapping, if you clap it too slow, it doesn't sound like together.

There are 3 sounds in there, right? I want you to figure out, when you start counting with one, there is a number that matches the same sound as together.

S: Matthew Fatz
Mi: Matth - ew Kratz
(holding up one finger at a time to count syllables)
Mi: You could go Matth - ew Kra - atz.

Ma: Eli

(all sing)

S: 15 (CC)
Je: 9 (C)
Ji: 15 (CC--checking), 20 (CC)
S: 22 (CCC)
L: Oh, I know. . . 101.
Ma: 29 (XXX, on knees)
L: I got one--31.
Let's try it.

31 (ccC) Does it sound like together?

Lisa, 31 (ccC), together (cCc), what's the same about them?

Right, now if it really fits, then we can sing 31 in the song, and it will sound okay. Let's try it. (singing in the son, thirTYone) What did you notice?

It doesn't really, because we changed the way we say it to make it fit in the song.

I'll give you a clue, it's lower than that. (singing twenTYtwo)

(singing twenTYone) Does it fit?

We say twentyONE (ccC), not twenTYone (cCc)

Does it fit? Put it in your hands.

Lisa, put 18 in your hands.

(singing) Does that work, Matthew? It has three syllables, but do we say seVENteen? (cCc)
Let's start at one and quietly count until we get to the first one that has three syllables. (singing in song) Does it fit? That's the only number I've found. You may be able to find another that fits (cCc) together.

Sing it--Does it sound okay? (Yea)

You're really good at nonsense words, Matt.

Discussion

Although a primary concern for the matching in this activity was the stress pattern, the students did not clap the stress in their responses. They also were mainly concerned with finding the same number of syllables as the given word. Using kinesthetic as a tool, they sorted through the multitude of possible number answers. The song also provided the final "check" for putting the guesses in the stress pattern of the given word, and seemed to be more helpful in hearing the stress pattern than were the spoken words.

Activity--Reading Neume Patterns

(showing them the X neume) (all do correctly)

This black means that its strong, so I want you to clap this.

Now some of you in here have names that would go right here because your name sounds like that.
Now, figure out this pattern.
(showing them the Xx neume)

One's light and one's dark; what does that mean to you?

Two syllables—how does it tell you to do them?

I do it this way, but it may be too hard (Cc-clap/fist)

Does anybody in here have a name that fits this? (Xxx neume)

Put your names where they belong under the pattern that fits them.

Discussion

The first claps to the neume (X) could have been the students' checking their own names rather than clapping the
pattern of the neume. Students had few problems clapping the correct stress pattern when the visual clue was offered as a guide. Matthew tends to be most obviously uncertain of the stress pattern of his name. Although the stress is changed within the neumes having equal numbers of syllables, in finding new words to fit, the students are still obviously concerned only with the number of syllables.

Rather than see a neume and find a word to fit, the students thought of a name and decided where it would go.

Activity—Matching Words to Neumes

Jeff, do you know any name that fits the same pattern as yours?

Je: Any name? You mean one syllable? Jeff . . . there's another Jeff in my room.

But we need a new one.

Je: Jason

Where does Jason go—put it where it belongs.

Je: (writes it under Xx neume)
Ma: My name has three syllables Matthew (CC) Eli (CC) Kratz (C)

Well, we don't have any patterns up like that.

L: I know one—How about Margaret?
Mi: (pointing to Xxx neume) Mar - gra - it (CCC)

Where does it fit? Clap it.

L, Ji, Mi: (CC)

Where does it go?

L: (points to Xx neume)
Ji: I know one--John (C- pointing to the X neume)
S: Zack (points to X neume)
Mi: Jean (CC)

So far, we don't have anybody's name that fits this-- clap this for me (Xxx neume)

L, Mi: (CCC)
Ji: (Ccc-clap/palm)
S: Here's how you do it (Ccc-Clap/fist/fist)
L: (Ccc)

I bet that somebody knows someone whose name sounds like that--see if you can find one for tomorrow.
Lesson #6

Song Activity--"Sally Goodin"

If you start counting with one, what's the first number you come to that has the same pattern as "puddin."

If it's right, then it'll fit into the song. (Sing song replacing puddin' with seven)
Are there any other words in the song with that pattern?

Let's find all the words in "Sally Goodin" that fit "seven"--the pattern of seven. Figure it out.

Are there any other words in the song for that pattern?

That fits but that's not in the song, Scott. I'm not sure there are any more.

Is there anyone in here whose name fits the seven pattern?

Is that a seven pattern? (sing Matthew's name in song) (sing in song)

I love that peach pie (singing) What number fits peach?

How about ten; does that fit?
If we had for the name of patterns, seven and ten, how many in here have a name that fits seven? Raise your hand.

Ma, Mi, L: (raise hands)

How many have a ten name? S, Ma, Ji, Mi, Je: (raise hands)

Discussion

Again concerned mainly with the number of syllables, students had few problems locating the "seven" words in Sally Goodin. Frequently, rhyming is a "transfer" that the students make when trying to match patterns (i.e. Scott's "heaven"). Matthew uses the clap/palm kinesthetic to figure out a lingual problem. Lisa recognized that the song pattern of "piece-a" is the same as "seven" even though she was asked to find a word. This was a valid "hearing" but was not immediately attended to by the teacher.

Although in this lesson, an attempt was made to explore the efficiency with which the students used the numbers to label the patterns, it quickly became apparent to the teacher that using student names held much more "vitality" for the students than did merely the numbers.

Song Activity--"Scotland's Burning"

Now, all the words in that song are only two different patterns—they're either sevens or tens.

(filling in for Missy) ten, ten, ten, ten; pour on water, pour on water. That one's tricky, isn't it?

Mi: Oh, 10, 10, 7; 10, 10, 7

How about just, "pour on 7"?

Mi: But "pour" is a 10 and "on" is a 10.

You're right Missy, but the way we sing it makes it a little bit different than the 10's.

(all sing the tune as 7, 7, 7, 7; 10, 10, 10, 10; 10, 10, 10, 10; pour on 7, pour on 7)

Whose name will fit Scotland's Burning?

Mi: Mine
Missy, Missy, Missy, Missy  
(singing)

How about 10:
Scott, Scott, Scott, Scott  
(singing)

Another 10:
Jill, Jill, Jill, Jill  
(singing)
Pour on seven

Good listening, Matthew, it could be. Some people say it as fire (Cc) and some say it as fire (C). I think probably in reading class you'd be taught fire is a one syllable word, but when we say it, it sounds like two. So we can do it that way if you want.

Who else can fit instead of Missy?

We need another ten (singing) pour on (singing)

Discussion

Missy quickly and accurately substituted the appropriate numbers for the song/word patterns. The teacher at this point could have acknowledged the quality of sound patterns that goes beyond the mere words, but chose not to in this activity. Matthew challenged the idea of "fire" being a ten and offered a good opportunity to discuss or present the occasional discrepancy between syllables read and syllables heard.
Lesson #7

Song Activity--"Sally Goodin"

Does anyone remember some of the words we put in yesterday? 

Okay, let's put ten and seven in (sing)

Oh, Matthew, I am always amazed at the good ideas you come up with. They fit, don't they?

Put it all away for Old Sally . . .

I love that . . .

And I love that gal they call . . .

We've been working with words and patterns of words, and you know that there are several patterns. What's one pattern you know?

Discussion

As a result of Matthew's changing the number labels to body parts, the students created their own version of the song using appropriate pattern matching. When asked what patterns they knew, the students responded with clapping
although no limitation was put on the mode of response. Perhaps they have identified patterns with the kinesthetic sense much more strongly than the lingual or the visual.

Activity—Making Visual Symbols

I want you to show me the sounds of some words I'm going to give you. (giving words in this order
1) peach pie, 2) student name, 3) together, 4) penny, 5) hello)

S:1) Peach is one syllable so I used one hammer and pie is another syllable so I used another hammer.
2) My name has one syllable so I just used one star.
3) Together has three syllables so I used three lines.
4) Weren't they supposed to be together? Here's penny ( \_/ ) and here's hello ( \_/ ). (says and follows symbols)

Ma:1) Peach pie is two syllables so I put two r's.
2) My name has two syllables so I put Matthew (saying and following).
3) This, I put to - geth - er (saying and following).
4) On penny, I put two dots.
5) Hello, I put two long ears.

Ji:1) Peach pie has two syllables, so I put two lines.
2) My name has one syllable, so I put one star.
3) For together, I put three circles.
4) Penny has (following) two syllables.
5) Hello (pointing and saying)
It's two different things for peach pie (pointing, speaking and following).

My name's misSY (pointing and speaking but accented second syllable).

For together there's three syllables.

For penny, I put PenNY (followed, but accented second syllable).

Hello is, hell - o (pointing to figure)

Peach pie, so I put two stars.

And this is my name, I put one.

Penny

Hello

For together I put three circles.

I made the middle one bigger.

(continually saying the word, then) Will you sing that again? I think it's the middle one, but I already wrote the first one (she changes her symbol to fit the xXx pattern).

(after I sing the song with the pattern she has written) Oh, it's the middle one.

None of the girls got it right, but all the boys did!

Discussion

The students were consistently accurate in making a visual symbol for the syllable pattern of the given words.
When asked to show the stressed syllable, more concentration was needed to decide which syllable was stressed and the responses were not as accurate. Only two students used the neume symbol suggested by the teacher in an earlier lesson. This would possibly indicate that the nine-year-olds take initiative rather than imitation in their visual symbolization.

Lesson #8

Song Activity—"Old Dan Tucker"

What other names would fit instead of Old DAN Tucker?

S: We could say Old Brad LEY Shaw (distorting the name to fit the pattern).

How does he say his last name?

S: Or you could have Bradley Michael or Brad Michael, cause my brother has a bunch of different names.

Okay, which one fits Dan (C) Tucker (Cc)?

S: Brad Michael

(after singing Scott's idea)

Who else?

Je: Old Man Tucker
Ma: Old Jeff Tucker (singing and slapping legs X X Xx)
Ma: Old Roy Smalley (singing and slapping arms on knees to the pattern)
He's a baseball player.

I want to see if you can read this to me. (X neume) There are many different ways to read.

S: It says (C).
Ma: (CCCCCCCC--random clapping)

That's what that says?

Ma: (C)
Je, Ji, Mi: (C)

Any words?

Je: black
Ji: box
Ma: (C)
Je: tape
Ma: boo!
Who can read this to me? (Xx neume)

Je: (CC, CC)
Ji: (Cc-hand/palm, Cc)
Mi: (CC-hand/palm, not with stress pattern
S: (Cc-clap/palm)
Ma: I know (Cc, Cc)

Any words?

Ma: Woof, woof (dog bark; no accent pattern)
S: Roof, roof (dog bark--low/high)
Mi: Missy
S: I got another one--meow (high meow (low and loud)
Ma: Matthew (Cc)
Ma: (Cc, Cc, Cc, Cc--clap/palm)

How about this one? (xX neume)

Ma: I know (Cc--palm/clap)
Je: Jeffrey

jeff-REY? or is it JEFF-rey?

Je: Either way is Okay.
Ma: Eli (Cc-clapped correctly, but did not match lingual)

Is it E-li or e-LI?

Ma: Eli (Cc)

The black one is the hard one, isn't it?

Ma: Eli (Cc-claps only on accent; distorting word to fit pattern

One more (Xxx neume)

Ma: (CCC-clapping clap/palm/palm without accent pattern)
S: I know two ways to read it. One is (CCC--clap/palm/palm without the accent pattern) and a word is Katherine (Ccc).

Discussion

Scott seemed more concerned with making his brother's name fit than with matching the given pattern. The common procedure for matching seemed to be rhyming, changing only part of the pattern or association of terms.

The first response again to "reading" a neume was kinesesthetic, and only after the teacher's suggesting such, did the students offer words. The words given by the students
were descriptive of the concrete object of the neume and also through association offered by one student, were animal sounds.

Scott's reading the Xxx neume was kinesthetically correct only in his recognizing the two white squares required a different hand motion. The performance of the pattern was contrived. Several children read the pattern by performing the loud and soft claps according to the neume squares, but not as a representative of lingual sound. When Scott put a word with the movement (Katherine) and clapped again, his movement was more representative of the stress-nonstress relationship of the pattern.

Lesson #9

Song Activity—"Hello"

Listen to this pattern, helLO, helLO (Cc, cc and singing). The pattern to that is up there someplace (on the wall).

Okay, clap hello for me please Lisa.

Oh, I see—I'm only thinking of "hello" though, Lisa.

Right, the black one stands for the heavy sound.

Scott, I want you to go up there, and we're going to sing it. When we get to that pattern, I want you to touch each side with the sound, so we can see where the accent is.

L: (pointing to xxxx neume)

L: (claps Cc, cc--thinking of a total of four sounds)

L: This one? (points to Xx neume)

L: This (xx neume).

Mi: HELlo (Cc), HELlo (Cc), HELlo (Cc)

Je: (xx, xx--hitting hand on arm)

S: (misses the first of the pair each time, but followed with the repeat)

Mi: I think that's hello (pointing to Xx neume)

L: It's HELL-o (Cc, saying and clapping).

Mi: But we don't say hell-o (shouting the O).
Right, that's exaggerating the word, but we do say "helLO" (singing), and we're listening in the song right now—the song makes it hel-LO. Lisa, try to tap it even harder on the black one.

Now, you know some people's names that fit that pattern.

What about Marguerite?

Where would Marguerite fit; does anyone know?

What do you think?

Jeff, check it out. You can clap to see what it sounds like or however you want to check it.

Did anybody find Marguerite? (singing the word in "hello") I think you're right. Let's put it in the song, and you follow, Jill.

Let's see if it will. It goes fast.

Oh, Jill you also mentioned a drink you know about. What was it? Which one would be Marguerita?

Do you remember which other one we discovered on that one.

L: (taps perfectly on the neume to the words and accent in the song)

Ji: Marguerite?

Ji: It has three syllables.
L: (CCC)

L: Marguerite, Marguerite (XXX, XXX--slapping thigh)
Je: How many syllables does Keith have?

L: Keith (C, C)
Je: Two? One!
S: Phil-lip
L: Phillip (CC)
Mi: Keith (C)

Je: (C) One

Ji: (points to xXx neume)

L: It won't fit.

Ji: (follows too slow first time, better on other three repetitions)

Ji: Marguerita

Ji: Marguerita (xxx neume--pointing to each syllable as she says it)

Ji: Punchinella (saying and pointing to squares of xxxx neume)
So, according to Jill's word, instead of Punchinella, we could sing about . . .

(see if it fits, (singing)
Oh, here we are . . .

Okay, I'm going to sing a song to you on "loo" and see if you can find the pattern I'm singing. loo Loo loo (sing XXX pattern several times)

You're exactly right!

Discussion

This lesson shows the extent to which the students were using multisensory tools for problem-solving. Their speaking, clapping, and reading the neumes are part of their "figuring" process and the tools they are using are their own choices of aids. Missy had difficulty with hearing the pattern XXX, because she objected to the exaggeration in the verbalization.

The students were listening carefully to determine the stress patterns, yet it seemed a necessary step for them to first determine how many syllables were present. Possibly because they clap slowly enough to count while saying word, the flow of the word is often missing during this stage.

Lesson #10

Activity--Working with the Neumes

(singing) Hello, hello
Choose a movement however you want to, so you can show me that you know which syllable is accented.

(none choose a movement that reflects the pattern)
Ji, Mi: (move to the beat)
Mi: (clap/patsch to accent; then one hand on each leg to the pattern)
Listen again, show me a movement that shows two sounds and which one is accented.

I asked you if you could show me which one was accented—think of how to show me through movement.

Okay, which one is accented of the two?

The first? (sing hello)

Okay, Jeff, show me that in what you just did.

Did you find which pattern up there fits "Hello"?

Okay, did anybody find any names to fit that pattern?

Okay, listen (singing) erIC, erIC. Does it fit that pattern? Which one does it fit, Lisa?

(singing) missY, missY

(singing) beCAUSE, beCAUSE It does work!

L: (xX--moving head)
Mi: (XX--hitting foot on the floor)
Je: (xx; xx; xx; xX--hitting hand on top of fist)
Ji: (XX; xX; xX; xX--hands one at a time on the floor)
Ma: (XX; XX; xX--throwing arms out with elbows bent--only coordinated once)

L: (same movement, showing the accent)

Je: (same movement, XX--no accent)
Mi: The first one (Cc--clap/palm).

Je: No, the second.

Je: (same movement, now accented xX)
Mi: (xX--clicking tongue)
Ma: (XX--up on one leg, laying backward, hops to pattern, no obvious accent)

L: Oh, I know (pointing to xX neume).

L: Yes, there's Judy, Eric.

L: This one (points to Xx neume).
Li: Missy?

Mi: I know one. Because I can't say it out loud, I'm not quite sure, but "because"?
Do we say sanTA?

miCHAEL (singing)
MatTHEW (singing)

I've got one--Michelle.
(singing Michelle and Renee in song)

L: How about Peggy?
(answering her own suggestion) PegGY (singing) No.
Ma: sanTA, sanTA (singing)

Ji: No, we say SANTa. It's black, blank.
Ma: Michael?

L: Matthew

L: That's what I was going to say!
Ma: Hosee, Hosea (singing)
L: Hosea (cc)
Ma: I know one, Hosea, Hosea
(clapping only on accented syllable twice)
Ma: rickY, rickY (cc, cc--distorting word)

Discussion

When given the choice of any movement to reflect the speech rhythm pattern, the students were not consistently accurate. Several of them seemed to need to explain the pattern in intellectual terms and then translate that into kinesthetic symbolization. Although Lisa quickly found the visual neume for "hello," she did not so easily find names to match this pattern. The song seemed to be a definite help in "setting" the pattern for analyzation—the students used it on their own.

Missy made a statement about her own thinking procedure which suggested that she did not totally trust her inner hearing. Matthew tends to be consistent in singing his answers in the song context.

Lesson #11

Song Activity--
Symbolization of Instrumental Patterns

Your puzzle for today is . . . I will play something that has a pattern repeating over and over. You think of what the symbol for that would look like. It doesn't have to look like the ones I've used up there (the neumes) just something
to show me how many parts and which one is the strongest, the loudest. I'll give you a puzzle in sound and you tell me on paper what you hear.

(playing recorder to melody of Scotland's Burning)

(1) xX Did it sound like a word? a symbol? Besires the pattern, write a word that fits.

(2) xxxX
(3) Xx
(4) xXx

(5) Now you'll each get your own pattern. Show me what you hear. Je--xXx; Ji--xxxXx; Ma--xxX; Mi--Xx (Scott and Lisa were absent)

Explanations: Je: (1) The first one wasn't the hardest part of the pattern, so I didn't color it in. And I used the word water.

(2) (No explanation)

(3) 1, 2, 3, 4, 5, 6 (singing)

(4) 

(5) 

Ji: (1) The first part sounded louder than the second part.

(2) 

(3) The first one was softer and the others were louder.

(4) (inaudible)

(5) My

If I don't understand them, I'll ask you about them.
Discussion

The nine-year-olds were much more adept at doing this activity than the seven-year-olds. Jeff's symbols were generally accurate for the pattern and his lingual labels tended to be more accurate than the visual symbols representing them (water, 1, 2, 3, 4, 5, 6). Using the neume idea of filling in the symbol for the stressed syllable, Jeff seemed to get confused on the placement of the darkened symbol. Jill was more accurate in hearing the number of sounds in the pattern than in hearing or explaining where the stress was. She did offer a lingual match for her symbols. Missy gave an accurate visual symbol and representative word on two items, but
her other visual symbols did not clearly identify a particular stress pattern. Matthew was able to offer a matching word or phrase for each aural pattern. Although the word patterns did not inherently match the aural pattern, Matthew sang them to the pattern when he explained his answers. His visual symbols accurately reflected the syllable pattern, but not the stress pattern of the aural stimulus.

It would be interesting to see how the results of this activity would vary if the students were asked to first match a word to the aural pattern and then draw a symbol for the word and sound pattern. The accuracy of the visual symbol may have been positively influenced had an intermediate step of lingual labeling been added.
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