The purpose of this research was to develop and to examine an improvisation curriculum designed to improve the music achievement of elementary school instrumental music students. The specific problems of this study were (a) to investigate the effect of improvisation study on the music achievement of fifth-grade wind and percussion students, and (b) to investigate the effects of various levels of music aptitude on the music achievement of fifth-grade wind and percussion students.

Sixty-six fifth-grade students participated in this study. Students who received instruction that included emphasis on improvisation were found to perform at significantly higher achievement levels than students who received instruction without such emphasis. High-aptitude students performed at higher achievement levels than low-aptitude and moderate-aptitude students. The data obtained in this research provide preliminary evidence that improvisation contributes to the improvement of instrumental music performance achievement in elementary students.

Christopher D. Azzara, University of Hartford

Audiation-Based Improvement Techniques and Elementary Instrumental Students’ Music Achievement

Music and improvisation have been inextricably linked throughout history. Improvisation in music is analogous to the extemporaneous expression of ideas in language. The Grove Dictionary of Music (fifth edition; Blom, 1954) defines improvisation as “the art of thinking and performing music simultaneously.” In many music classrooms, however, there are a variety of definitions regarding the readiness, outcomes, and skills associated with improvisation. Improvisation, therefore, receives disparate amounts of emphasis in American music classrooms in spite of its rich historical legacy.

Improvisation is defined and incorporated into music education curricula in many ways. Flohr (1979) refers to the Manhattanville Music Curriculum Project (MMCP) definitions for improvisation (Thomas, 1970). Flohr’s research incorpo-
rated a hierarchy of "exploratory improvisation," "free exploration," and "guided exploration." Montano (1983) defines improvisation as the freedom to perform any pitches (melodic material) within a five-finger span while performing specific rhythms and textures. Wilson (1970) examined the effects of group improvisation on the musical growth of selected high school instrumentalists. The method of improvisation used in Wilson's study was one originated by Lukas Foss and Richard Duffalo and adapted for secondary school use by Marvin Silverman. Students became familiar with a hierarchy of intervals and their relationships to their guide tone, that is, the note selected as the tonal center (Wilson, 1970, p. 62).

Particular attention has been given to the improvisational expressions of young children. From 1941 to 1951, Moorhead and Pond (Pillsbury Foundation, 1978) published one of the first series of studies of children's improvisations based on their work in the 1940s at the Pillsbury Foundation School in Santa Barbara, California. Orff and Dalcroze general music curricula emphasize the importance of improvisation. Orff activities incorporate the use of improvised rhythms, bobbins, and pitches from the pentatonic scale (Munsen, 1986; Reinhardt, 1990). Jaques-Dalcroze saw improvisation as "basic to life, as an expression of life, and as life itself" (Abramson, 1980, p. 68). Joseph (1982) studied a Dalcroze Eurhythmics approach to the music learning of kindergarten children.

Sloboda (1988) edited a textbook containing contributions from various authors interested in generative processes in music, that is, the psychology of performance, improvisation, and composition. The editor commented on researchers' neglect of generative processes in music and cited three concerns: cultural bias, problems of measurement, and problems of control. Contributors Sagi and Vitanyi studied the spontaneous improvisations of untrained Hungarians and emphasized the global features of style and structure inherent in their improvisations. Pressing (Sloboda, 1988), who surveyed concepts from many disciplines that are pertinent to improvisation, wanted to understand how people improvise and how improvisational skill is learned and taught. Pressing presented a cognitive model for the process of improvisation and related this model to improvisation skill acquisition.

Many of the studies and curricula for improvisation focus primarily on teaching improvisation through imitation and music theory. Alibrio (1988), Paulson (1985), Bash (1983), Baudo (1982), Schenkel (1980), Burnsed (1978), Hores (1977), Aitken (1975), and Briscuso (1972) are examples of researchers who studied various approaches to jazz improvisation with implications for improving music instruction, curriculum, and jazz improvisation skills. Music educators such as Schmid (1985) and Froseth (1988) have developed improvisation texts for beginning instrumentalists. Berkowitz (1975) approaches improvisation through keyboard harmony. Jazz pedagogues such as Aebersold (1989), Baker (1979), Coker (1970), Dobbins (1977, 1988), Ricker (1975, 1977), Spera (1976), Konowitz (1976), and Haerle (1975) have designed improvisation curricula, techniques, and recordings for instrumental instruction. These approaches include an understanding of scales, patterns, articulation, and phrasing in relation to various chords.

Spontaneity is a central ingredient to most definitions of improvisation found in related research. A common thread in many of the improvisation curricula for instrumental music education is the use of patterns and scales as resource material. Although this usage is prevalent, patterns and scales are often taught with little regard for an individual's comprehension of tonality and meter. Spontaneous per-
formance is not the expression of aimless, random tonal and rhythm patterns. It is the meaningful manipulation of tonal and rhythm music content created in ongoing musical thought. Successful improvisation is dependent on the recognition of relationships among tonal, rhythmic, and expressive elements, that is, the assimilation of the syntactic features of the music. A person must create organized musical meaning in his or her thought processes in order to be able to manipulate the structures of music into an organized, spontaneous, meaningful performance.

Seashore (1938), Serafine (1988), and Sloboda (1985) attempt to describe mental processes that enable people to create meaning in music. In his description of audiation, Gordon (1993) offers a definition of how a person understands and creates meaning in music. The term audiation is the result of research that occurred after the publication of the Musical Aptitude Profile, or MAP (Gordon, 1965/1988). Cutietta (1991) and Walters (1991) describe the history and research associated with the MAP. As it is described in the instructional materials used for this study, “audiation is to music what thinking is to language” (Grunow & Gordon, 1989, p. 10). The abilities to retain, recall, compare, and predict are recognized as primary mental functions in Gordon’s definition of audiation. The ability to internalize and bring organization to aural structures of music through audiation is necessary for the meaningful manipulation of tonal and rhythmic information.

**Definition**

Improvisation is a manifestation of musical thought. In this research, improvisation means that an individual has internalized a music vocabulary and is able to understand and to express musical ideas spontaneously. Just as every culture has its language, every culture has its music. Improvisation is to music what speaking is to language. Individuals improvise daily with language when engaging in conversation. Dobbins (1980) compares the improvisation process to language:

> Full proficiency in a verbal language must include the ability to command a considerable vocabulary with equal facility at the reading, conversational, and intuitive levels. The development of proficiency in a music “language” involves the same general process. The ability to play a Beethoven sonata or an Art Tatum solo is, by itself, no more an indication of musical creativity than is the ability to read a Shakespeare play an indication of the ability to use the English language creatively. (p. 37)

Like an individual’s contribution to conversation, improvisation in music is generated from an internal source. To understand music, one must think musically. Improvisation skill allows students to express musical thoughts and ideas from that internal source, with meaning. When thought of in this light, improvisation is at the heart of musical expression and is fundamental to all types and levels of music instruction and curriculum. Teaching students to improvise promotes their acquisition of higher-order music thinking skills. Asking students to improvise as a part of instrumental music instruction would reasonably increase a student’s ability to manipulate mentally the structures of music with purpose and meaning.

Students also demonstrate music thinking skills when they perform from music notation, either when sightreading or when reading prepared literature. An expressive and accurate performance of melody and rhythm from notation requires a person to recognize and to understand the meaningful relationships among the aural events of music. As a performer reads notation and elicits corresponding instrumental sounds (across time), a mental construction of tonality
and meter occurs. A lack of music recognition and aural understanding would result in a performance with poor music syntax characterized by poor intonation, incorrect notes, and incorrect rhythms.

Challenging young instrumentalists to improvise music in order to acquire higher-order music thinking skills may have two beneficial results: (a) meaningful creative performance and (b) the performance of music from notation with greater recognition and understanding of music structure, as demonstrated through accurate and precise performance. Improvising may be an effective method by which beginning instrumental music students could acquire the music thinking skills necessary to perform from notation with greater understanding as demonstrated by higher performance achievement levels.

Learning to improvise is a demonstration of acquired music thinking skills. Is it possible that improvisation contributes to improved instrumental music achievement in nonimprovisatory performance skills such as reading familiar and unfamiliar music? It would seem prudent to investigate the relationship between advanced music thinking skills (improvisation) and tonal, rhythmic, and expressive music achievement. Is it also possible that understanding the relationships among music aptitude, improvisation, and music reading could facilitate elementary instrumental music instruction?

The purpose of this research was to develop and to examine an improvisation curriculum designed to enhance the music achievement (music reading) of elementary school instrumental music students. The specific problems of this study were: (a) to investigate the effect of improvisation study on the music achievement (music reading) of fifth-grade instrumental (wind and percussion) music students, and (b) to investigate the effects of different levels of music aptitude on the music reading performance achievement of fifth-grade instrumental music students who received improvisation study as a part of instrumental music instruction.

METHOD

Subjects

The subjects for this research were 66 fifth-grade instrumental music students who had been studying an instrument for one year. The student population was predominantly white, and a range of other ethnic heritages was represented. The students came from different economic levels best described as middle class.

Instruments

All of the students were administered the MAP (Gordon, 1988) as a measure of music aptitude. This standardized measure of music aptitude includes three sections: Tonal Imagery, Rhythm Imagery, and Musical Sensitivity. Norms are provided in the test manual for grades 4–12. Each section contains tape-recorded excerpts, and students are asked to discriminate between "like" and "different" or "same" and "different" paired instrumental performances.

Each student's music achievement was measured by having individuals perform three études written by the researcher. The first étude was student-prepared without teacher assistance; the second étude was prepared with the help of the teacher; and the third étude was sight-read. The études (Figure 1) contained tonic, dominant, and subdominant tonal pattern functions and macrobeat, microbeat,
division, elongation, and rest rhythm pattern functions. Each teacher recorded all performances on audiotape for subsequent evaluation and identified the students by number only. The researcher randomly mixed these recordings to a master tape and renumbered the performances to conceal students' identities. Four judges independently rated the recorded performances on three separate occasions, once for tonal performance (66 students x 3 études = 198), once for rhythm performance (66 x 3 = 198), and once for expressive performance (66 x 3 = 198). A total of 594 (198 + 198 + 198) recordings were heard by each judge. The judges were three graduate students and one undergraduate student enrolled at a uni-

Figure 1. Etudes used for final criterion measures.
iversity school of music located in the northeastern United States. All the judges had prior experience using rating scales in the measurement of student music performance skills. Recorded examples of instrumental performances that corresponded to the different criterion levels for the three dimensions of the rating scale were examined by the judges as a method of preparation prior to actual performance adjudication.

The judges used a rating scale with a 5-point continuous criteria tonal dimension, a 5-point continuous criteria rhythm dimension, and a 5-point additive criteria expression dimension to measure three different student performances. Continuous criteria are arranged in a hierarchical order; each successive criterion assumes proficiency at the previous level(s). The criteria are interdependent. Judges use the rating scale by indicating the written criterion level that corresponds to their perception of the student’s performance. Additive criteria are not hierarchical in the presentation of performance criteria; the student may be able to perform at levels that correspond to any, all, or none of the criteria. The criteria are independent. A judge indicates the single or multiple number of criteria that characterize the student’s instrumental performance. The three dimensions of the rating scale (Figure 2) used for student performance evaluation were designed by the researcher. The researcher defined and demonstrated each criterion of every dimension (0, 1, 2, 3, 4, and 5) for the judges prior to their actual judging. After each student performance, judges recorded the number of the performance criterion that corresponded to their perceived level of student instrumental music performance.

The criteria used in the tonal and rhythm dimensions of the rating scale relate to function in terms of tonal and rhythm progression; that is, tonic patterns serve as the reference point for all other tonal functions, and macrobeats serve as the reference point for all other rhythm functions. Harmonic progression is defined in a linear sense by (a) where the harmony changes (tonality), and (b) when the harmony changes (meter).

Procedure

The research design involved two elementary schools (school A and school B) in centralized suburban school districts near Rochester, New York. A total of 66 students participated in this research (45 from school A and 21 from school B). Each setting consisted of an experimental group and a control group.

Two teachers participated in the study; thus, data could be analyzed for teacher effect. Teacher effect was controlled by having each instructor teach both an experimental group and a control group. Teacher 1 (school A) had 6 years of experience teaching elementary instrumental music in the public schools. Teacher 2 (school B) had 7 years of experience teaching elementary instrumental music in the public schools. Prior to the implementation of the study, the researcher instructed the teachers twice a week for 2 weeks. During each session, which lasted approximately 3 hours, the researcher and the teachers reviewed the methods and techniques necessary to implement the improvisation curriculum for the second half of the treatment period.

Prior to students receiving instruction, all were administered the MAP (Gordon, 1965/1988) to measure music aptitude. Students were grouped according to the procedure recommended by Gordon (Gordon, 1993, p. 246). For example, students with MAP scores greater than or equal to the 80th percentile were identified as high-aptitude students; students with MAP scores greater than
RATING SCALE

Tonal (continuous criteria: 0–5)

1 The student plays first and/or last note correctly.
2 The student performs all patterns in one function correctly (tonic reference).
3 The student performs all patterns in one function (tonic) correctly and some patterns in one other function correctly.
4 The student performs all patterns in two functions correctly.
5 The student performs all tonic, dominant, and subdominant patterns (functions) correctly.

Rhythm (continuous criteria: 0–5)

1 The student maintains a consistent tempo (steady beat) throughout.
2 The student maintains a proper sense of meter throughout (macrobeat reference).
3 The student performs all patterns in one function (macrobeats) correctly, and some patterns in one other function correctly.
4 The student performs all patterns in two functions correctly.
5 The student performs all patterns in all functions correctly.

Expression (additive criteria: 0–5)

1 The student gives movement to the music.
1 The student demonstrates an understanding of dynamics.
1 The student has good tone quality.
1 The student plays with an appropriate style of articulation.
1 The student demonstrates an understanding of the appropriate phrasing.

Figure 2. Rating scale.

the 20th percentile and less than the 80th percentile were identified as moderate-aptitude students; and students with MAP scores less than or equal to the 20th percentile were identified as low-aptitude students.

Students were then randomly assigned to an experimental or a control group. Within each of the treatment groups, subgroups of homogeneous instrument groupings were established. Students were taught in groups of three to seven; each group received one 30-minute period of instruction per week. In addition to one group lesson per week, all the students had one ensemble (concert band) experience per week. Prior to the present study, all of the subjects had completed 1 year of instrumental music instruction.

The experimental group and the control group received instruction using Student Book One and the Home-Study Cassette from Jump Right In: The Instrumental Series (Grunow & Gordon, 1989). The instruction associated with this method includes a "sound before sight" learning process; that is, students perform without notation before they perform with notation, and singing and movement activities
Musical Aptitude Profile

27 Weeks of Instruction; Weekly 30-Minute Lessons:

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumental Instruction with Improvisation Emphasis</td>
<td>Instrumental Music Instruction</td>
<td>Instrumental Instruction with Improvisation Emphasis</td>
<td>Instrumental Music Instruction</td>
</tr>
</tbody>
</table>

Criterion Measure:

- **Instrumental Performance Rating Scale**
- **Students Performed Three (3) Etudes**

*Figure 3. Procedure used in this study.*

are included as an integral part of the instruction. Through the use of specified teaching techniques, students acquire a vocabulary of tonal patterns and rhythm patterns. The lesson plans provided with the series (20 in total) were taught by both teachers. For each lesson, the experimental group and the control group received parallel instruction in the skills and content associated with the method. The order and the duration of the lesson content were designed to be identical for all instructional groups; the students in the experimental group, however, participated in improvisation performance activities designed by the researcher for 10–15 minutes of their 30-minute lesson per week (16 improvisation lesson plans in total were used over the 27-week period). These improvisation activities were based on the instructional activities found in the 20 lesson plans provided with the instrumental series. The students in the improvisation group were provided with an additional cassette tape to reinforce the improvisation activities performed in class. Improvisation activities comprised (a) learning selected repertoire of songs by ear, (b) developing a vocabulary of tonal syllables and rhythm syllables, and (c) improvising with their voices and with their instruments tonic, dominant, and sub-dominant tonal patterns within the context of major tonality, and (d) improvising with their voices and with their instruments macrobeat, microbeat, division, elongation, and rest rhythm patterns within the context of duple meter. The treatment period of instrumental music instruction lasted 27 school weeks.

During the 14th week of the study, the teachers participated in two additional
3-hour sessions with the researcher. The purpose of these sessions was to continue to review the methods and techniques necessary to implement the improvisation curriculum and to monitor the teachers' progress.

To ensure compliance with the instrumental method and the improvisation curriculum and to monitor control, the researcher visited each educational setting at least two times per month. Sessions were audiotaped and/or videotaped at least once every month in order to monitor the instruction by the teachers and the progress of the students. In order to document the students' improvisations, the teachers tape-recorded improvisation performances that the researcher then transcribed. Samples of this documentation are found in Figure 4.

At the end of the treatment period, each student individually performed three criterion études that were used to measure their individual musical achievement. The first étude was prepared by the student without teacher assistance, the second étude was prepared with the help of the teacher, and a third étude was sight-read. The teacher-assisted étude was given to the students 2 weeks prior to the recording and prepared with the instructor during the students' lesson. Each student was evaluated by four independent judges with the use of a rating scale with three

![Example 1](image1)

![Example 2](image2)

Figure 4. Sample improvisation performances ("London Bridge").
dimensions. Each performance was measured in regard to the student’s tonal, rhythm, and expressive performance. The researcher conducted two pilot studies to investigate the interjudge reliability for the music achievement rating scale. The tonal and rhythm dimensions of the rating scale used in this study are the result of modifications made to the rating scale used in the pilot studies.

**Statistical Design and Analysis**

Interjudge reliability from among the four independent judges was determined for each of the instrumental achievement dimensions of the rating scale (tonal, rhythm, and expression) by the alpha factor analysis (Cronbach’s alpha). A two-dimensional treatment (improvisation) by levels (aptitude) design was used to determine how type of instrumental music instruction and music aptitude contribute to instrumental music achievement among fifth-grade students.

Group mean differences of measured instrumental music performance for students with high, moderate, and low music aptitude who received two different types of instruction were analyzed using a two-way analysis of variance procedure.

**RESULTS**

Table 1 presents the interjudge reliability (alpha coefficients) for Etude 1, Etude 2, and Etude 3. The overall interjudge reliability was found to be .94. The high overall reliability indicates a high level of consistency of the performance evaluations among the four judges.

<table>
<thead>
<tr>
<th></th>
<th>Tonal</th>
<th>Rhythm</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etude 1</td>
<td>.95</td>
<td>.94</td>
<td>.93</td>
</tr>
<tr>
<td>Etude 2</td>
<td>.94</td>
<td>.93</td>
<td>.94</td>
</tr>
<tr>
<td>Etude 3</td>
<td>.96</td>
<td>.93</td>
<td>.90</td>
</tr>
</tbody>
</table>

Means and standard deviations were calculated for the students’ scores on the MAP. The composite reliability coefficient derived from the standardization sample of the MAP for grade five is .91 (Gordon, 1988, p. 65). There was no significant difference in the composite MAP scores between the experimental group and the control group, and there was no significant difference in the composite MAP scores between subjects from the two school settings.

There was no significant difference between the data produced by students from School A and the data produced by students in School B. In other words, there were no significant differences as a result of teaching style or setting. The data presented here, therefore, combine Teacher 1 (School A, n = 45) and Teacher 2 (School B, n = 21).

Shown in Table 2 are the means, standard deviations, and the two-way analysis of variance summary for the composite instrumental performance étude scores. The Etude Composite represents the combined judges’ ratings for the different modes.
of achievement in reading (tonal, rhythm, and expression for the student-prepared étude, teacher-assisted étude, and sight-read étude). No significant interaction was found between type of instruction and level of music aptitude. There was, however, a main effect both for type of instruction and for music aptitude. Students who received instrumental music instruction that included an improvisation curriculum were found to have significantly higher composite étude performance scores than those students who received instrumental music instruction without an emphasis in improvisation. Students who received improvisation instruction were found to have significantly higher composite performance scores for Etude 2 (teacher-assisted) and Etude 3 (sight-read) than those students who received instrumental music instruction without an emphasis in improvisation.

Table 2A
Means, Standard Deviations, and Two-Way Analysis of Variance Summary Table for Composite Etude Scores

<table>
<thead>
<tr>
<th></th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 1 + Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean S.D.</td>
<td>Mean S.D.</td>
<td>Mean S.D.</td>
</tr>
<tr>
<td>n = 33</td>
<td></td>
<td>n = 33</td>
<td>n = 66</td>
</tr>
<tr>
<td>Etude Tonal Composite</td>
<td>3.79 .95</td>
<td>4.28 .86</td>
<td>4.04 .93</td>
</tr>
<tr>
<td>Etude Rhythm Composite</td>
<td>2.72 1.31</td>
<td>3.46 .94</td>
<td>3.09 1.19</td>
</tr>
<tr>
<td>Etude Expression Composite</td>
<td>2.21 1.03</td>
<td>2.79 .91</td>
<td>2.50 1.01</td>
</tr>
<tr>
<td>Etude 1 Composite (Student-Prepared)</td>
<td>3.05 1.16</td>
<td>3.45 1.06</td>
<td>3.25 1.12</td>
</tr>
<tr>
<td>Etude 2 Composite (Teacher-Help) *</td>
<td>2.98 1.14</td>
<td>3.74 .88</td>
<td>3.96 1.08</td>
</tr>
<tr>
<td>Etude 3 Composite (Sight-Read) *</td>
<td>2.68 1.15</td>
<td>3.36 .91</td>
<td>3.02 1.08</td>
</tr>
<tr>
<td>Etude Composite *</td>
<td>2.90 .99</td>
<td>3.51 .79</td>
<td>3.21 .94</td>
</tr>
</tbody>
</table>

† = A recording malfunction occurred for one performance of Etude 2.
* Significant at the .05 level.

A post hoc Duncan's Multiple Range Test was performed to determine which of the three aptitude means was significantly different from the others (Table 3). The mean performance achievement scores of high-aptitude students were significantly greater than the mean achievement scores of low-aptitude and moderate-aptitude students. As shown in Table 3, low-aptitude subjects performed better than medium-aptitude subjects.
Table 2B

**Dependent Variable: Etude Composite**

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
<th>Sum of squares</th>
<th>Mean square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aptitude</td>
<td>2</td>
<td>11.09</td>
<td>5.54</td>
<td>7.93  *</td>
<td>0.0009</td>
</tr>
<tr>
<td>Instruction</td>
<td>1</td>
<td>3.30</td>
<td>3.30</td>
<td>4.72  *</td>
<td>0.0337</td>
</tr>
<tr>
<td>Aptitude X Instruction</td>
<td>2</td>
<td>0.97</td>
<td>0.48</td>
<td>0.69</td>
<td>0.5038*</td>
</tr>
</tbody>
</table>

*Significant at the .05 level.

Table 3

**Duncan’s Multiple Range Test for Variable: Etude Composite Aptitude Level**

<table>
<thead>
<tr>
<th>Duncan Grouping</th>
<th>Mean</th>
<th>N</th>
<th>Aptitude Level *</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3.73</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B A</td>
<td>3.37</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>2.85</td>
<td>36</td>
<td>2</td>
</tr>
</tbody>
</table>

* Aptitude Levels: 3 = high aptitude level; 2 = medium aptitude level; 1 = low aptitude level

**DISCUSSION**

The data obtained in this research initially indicate that improvisation study contributes to the improvement of fifth-grade students’ instrumental music performance achievement. While additional research is necessary, the results of this study provide preliminary evidence to suggest that improvisation skills contribute to more accurate student instrumental performances when reading from notation. When improvisation was included as a part of elementary instrumental music instruction, students were provided with opportunities to develop an increased understanding of harmonic progression through the mental practice and physical performance of tonal and rhythm patterns with purpose and meaning. Improvisation ability appears to transfer to a student’s clearer comprehension of the tonal, rhythmic, and expressive elements of music in an instrumental performance from notation.

Further investigation should be undertaken to determine whether the mean differences between the two groups for the three études indicate that the improvisers had the readiness to benefit from what the teacher was attempting to teach (Table 2). Also, additional research with a larger $N$ should be pursued to investigate the initial result indicating that low-aptitude subjects outperformed medium-aptitude subjects (Table 3).

Continued research should involve an examination of the role and definition of improvisation in music education. Investigations of the relationship between improvisation and music performance skills should occur at all achievement levels in instrumental, vocal, and general music instruction. Specific content areas could initially include music in major and minor tonalities and duple and triple
eters. Future studies should use improvisation as a criterion measure to discover whether superior improvisers are also superior performers of music when reading from notation.

Music students spontaneously express themselves through improvising music, analogous to the manner in which they express themselves in language when engaging in conversation. Speaking and conversing serve as a readiness for reading language and enhance the understanding of the written word. Similarly, improvisation enhances the performance of notated music. Researchers should continue to consider the role of improvisation as a readiness for learning how to comprehend music notation. The link between improvisation and elementary instrumental music performance achievement appears to be important. The results of this research suggest that improvisation should be a fundamental part of instrumental music instruction.

ENDNOTE

1. For further discussion of the construction and use of continuous and additive rating scales refer to Gordon, 1993; Rutkowski, 1990; and Saunders, 1990.

REFERENCES


October 19, 1993