

AN INVESTIGATION TO DETERMINE WHETHER LEARNING
EFFECTS ACCRUE FROM IMMEDIATE SEQUENTIAL
ADMINISTRATIONS OF THE SIX LEVELS
OF THE IOWA TESTS OF MUSIC LITERACY

by

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A thesis submitted in partial fulfillment of
the requirements for the degree of Doctor of
Philosophy in the School of Music in the
Graduate College of The University of Iowa

May, 1973

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ABSTRACT

The specific problem of the study was to investigate whether subtest scores on any Level of the Iowa Tests of Music Literacy are affected by an immediate previous administration of a lower Level of the battery.

The subjects who participated in the investigation were eighth grade students enrolled in general music classes in twelve junior high schools in the city of Des Moines, Iowa. The test results of thirteen hundred and forty-nine students were used in the analysis of data.

For each Level of the ITML battery, 2 through 6, test results from two different groups of students were compared. The first administration group was comprised of students who took a given Level as an initial experience and the second administration group was comprised of students who took that same Level after one of the lower Levels of the battery was administered to them.

Score distributions for each ITML Level were derived for each of the fifteen possible corresponding

first and second administration groups. Standard score equivalents were compared at thirteen selected percentile ranks which represented low, average, and high ranges of student achievement.

From a total of ninety subtest comparisons, the second administration score distributions for eleven tonal and eighteen rhythmic subtests were found to exhibit differences of consequence at some range of achievement. One tonal subtest, T_1 of Level 5, was affected by increased scores at low and/or average ranges of achievement after the previous administration of all four lower Levels of the battery. On Levels 4 and 5, the rhythmic subtest R_1 , was affected by increased scores following the administration of Levels 2 and 3. Also on Levels 4 and 5, the rhythmic subtests, R_2 and R_3 , were affected by increased scores following the administration of Level 3. For all remaining second administration score distributions, differences of consequence were negative.

From the results of this study it may be concluded that, in general, scores on a higher Level of the Iowa Tests of Music Literacy are not affected by an immediately prior administration of a lower Level of the battery. However, when the following subtests of a given

Level are administered immediately after corresponding subtests of the indicated lower Levels, caution should be tentatively observed in interpreting resultant scores because there is reason to believe that they may be spuriously high:

- T₁: Tonal Aural Perception, Level 5 after Levels 1, 2, 3, and 4.
- R₁: Rhythmic Aural Perception, Levels 4 and 5 after Level 2.
- R₁: Rhythmic Aural Perception, Levels 4 and 5 after Level 3.
- R₂: Rhythmic Reading Recognition, Levels 4 and 5 after Level 3.
- R₃: Rhythmic Notational Understanding, Levels 4 and 5 after Level 3.
- R₃: Rhythmic Notational Understanding, Level 5 after Level 1.

Also, when the following subtests of a given Level are administered immediately after corresponding subtests of the indicated lower Levels, caution should be tentatively observed in interpreting resultant scores because there is reason to believe that they may be spuriously low:

- T₁: Tonal Aural Perception, Level 5 after Level 4.
- T₁: Tonal Aural Perception, Level 6 after Level 2.

- T₂: Tonal Reading Recognition,
Level 4 after Level 1.
- T₂: Tonal Reading Recognition,
Level 5 after Level 4.
- T₂: Tonal Reading Recognition,
Level 6 after Level 2.
- T₃: Tonal Notational Understanding,
Levels 4 and 6 after Level 3.
- T₃: Tonal Notational Understanding,
Levels 5 and 6 after Level 4.
- R₁: Rhythmic Aural Perception,
Level 3 after Level 1.
- R₁: Rhythmic Aural Perception,
Level 6 after Level 3.
- R₂: Rhythmic Reading Recognition,
Level 3 after Level 1.
- R₂: Rhythmic Reading Recognition,
Level 5 after Level 4.
- R₂: Rhythmic Reading Recognition,
Level 6 after Levels 3 and 5.
- R₃: Rhythmic Notational Understanding,
Level 3 after Levels 1 and 2.
- R₃: Rhythmic Notational Understanding,
Level 5 after Level 4.

It is recommended that this study be replicated and that the added dimension of students' musical aptitude be included in the design. If the results of future studies are consistent with those of this

study, it would be feasible to develop a second set of norms for those subtests which are affected by an immediately prior administration of a lower Level of the ITML battery.

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April 19, 1973 date

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Chapter I

PURPOSE OF THE STUDY

Introduction

That educators are concerned with objectivity in measurement of students' academic progress is reflected in the emphasis on the development of standardized achievement tests in all disciplines.¹ When used for a purpose for which it has been validated, a standardized test provides the teacher with a reliable instrument for evaluating the achievement of individual students as well as the accomplishment of an entire class. Most importantly, standardized achievement tests provide for the evaluation of an individual student's growth in a discipline in relation to

¹Robert Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education (New York: John Wiley and Sons, 1969). "The word standardized in a test title means only that all students answer the same questions and a large number of questions under uniform directions and uniform time limits, and that there is a uniform or standard reference group to which a student's performance can be compared. . . The description is basically in relative terms, that is, in relation to the performance of a sample carefully chosen to represent the country as a whole, or to represent some more delimited norm group." p. 257.

his capacity for potential development, "in order to enhance his strengths, while compensating for those areas in which he is deficient."²

The progress of music education has suffered from a dearth of standardized musical achievement tests.³ Particularly lacking have been means of objectively evaluating musical growth in order to meet the individual musical needs of students. This limitation contributes to the possibility of overlooking the early development and continued encouragement of musically talented students. A probable cause for the scarcity of standardized musical achievement tests is that music curricula are largely subjective in nature. That is, in general, in contrast to subject-matter goals for other disciplines, musical goals for grade levels have

²Edwin Gordon, The Psychology of Music Teaching (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1971), p. 62.

³William E. Whybrew, Measurement and Evaluation in Music, 2nd ed. (Dubuque, Iowa: Wm. C. Brown Co., 1971). "There probably are few fields other than music in which less attention has been given by teachers and practitioners in general to the development of sound and efficient techniques of measurement and evaluation. . . While the nature of music and music instruction is such as to make an objective approach difficult, many examiners and auditioners probably are guilty of insufficient effort toward this end." p. 2.

not been specifically established.^{4,5} And, because a standardized musical achievement test would seem, by its very nature, to be based on uniform objectives, the development of such tests has been hampered.

The problem was succinctly stated in a report from a seminar held in 1963 at Yale University on the topic, "Music Education, A Search for Improvement."⁶ Thirty-one professional musicians and music educators, together with scholars invited from other disciplines, concluded that a model curriculum should be developed, but their consensus was that this curriculum would depend for its success upon careful evaluative techniques.

⁴Ibid., "Standardized achievement tests in music have, in general, attracted less attention and interest than have attempts at measuring aptitude for this field. There undoubtedly are a number of reasons for this. Most obvious perhaps, is the fact that course content in various types of music activity is not very well standardized." p. 149.

⁵Paul R. Lehman, Tests and Measurements in Music (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968). (There has been a) "lack of consensus among music teachers as to what specific outcomes should be expected as a result of instruction in music. Concurrently, there has been a lack of agreement on what specific musical experiences and activities should constitute the curriculum, for one can scarcely know how to proceed if he has not identified his goal." p. 57.

⁶Claude Palisca, "Music Education, A Search For Improvement," Yale Seminar Report (Washington, D.C.: Office of Education, Comprehensive Research Program, 1963).

"The first phase of this evaluation will depend upon devising tests, both achievement and predictive, a difficult task in an area where tests have been a great stumbling-block because of the non-verbal nature of the subject."⁷

Undoubtedly, the non-verbal nature of music has also contributed to the lack of clearly identified objectives to serve as acceptable measurable goals and upon which members of the profession might have a basis for concurrence.⁸

Conversely, the lack of objective measures of musical achievement has possibly deterred the identification of specific goals upon which music educators might agree.^{9,10}

⁷Ibid., p. 29

⁸Robert F. Mager, Preparing Instructional Objectives (Palo Alto, Calif.: Fearon, 1962). According to Robert Mager, three steps are necessary to the development of a course of study or curriculum. Summarized, they are:

- 1) to decide upon goals or objectives (what will or can the student do on reaching the goal?)
- 2) to select procedures, content and methods relevant to the desired goals or objectives which are appropriate to the subject matter and in accordance with principles of learning.
- 3) to measure and evaluate the student's performance according to the goals or objectives.

⁹Ibid., "When clearly defined goals are lacking, it is impossible to evaluate a course or program efficiently, and there is no sound basis for selecting appropriate materials, content, or instructional methods." p. 3.

¹⁰Gordon, Psychology, "The structure of a comprehensive test could serve as a curricular guide before the battery is used for evaluative purposes." p. 130.

The Iowa Tests of Music Literacy,¹¹ (ITML)¹², a multi-level battery of standardized musical achievement tests, were published in 1971 by The University of Iowa. The ITML battery is self-contained and tape-recorded in six sequential Levels which correspond in content, but increase in musical complexity from Level to Level.

By the use of the words "music literacy" in the title of the battery, the test author suggests that the development of a foundation for music literacy is the overall purpose of music education in the schools. Also implied is that aspects of musical achievement can be measured in terms of the development of those musical concepts which form a foundation for music literacy. He states:

"Fundamental musical achievement comprises tonal and rhythmic aural perception (the ability to distinguish mode and meter when listening to music) and tonal and rhythmic literacy (the ability to musically hear and feel what one reads and writes in notational form)."¹³

The author indicates that the tonal and rhythmic skills

¹¹Edwin Gordon, Iowa Tests of Music Literacy (Iowa City: The University of Iowa, 1971).

¹²Hereafter, ITML will be used to represent the title, Iowa Tests of Music Literacy.

¹³Edwin Gordon, ITML Manual (Iowa City: The University of Iowa, 1971), p. 1.

identified at each level of ITML constitute specific, measurable objectives for music education. He states in the ITML Manual:

"The value of a test is determined by the extent to which its use improves and develops individual talent. To these ends the Iowa Tests of Music Literacy may be used for the following four specific purposes:

- 1) to diagnose a student's individual strengths and weaknesses in six different dimensions of tonal and rhythmic aural perception and music literacy achievement.
- 2) to compare a student's tonal and rhythmic aural perception and music literacy achievement to his musical potential, as measured by the Musical Aptitude Profile.¹⁴
- 3) to evaluate the extent of a student's continuous development from simple to complex tonal and rhythmic aural perception and music literacy achievement.
- 4) to determine a student's relative standing among other students in tonal and rhythmic aural perception and music literacy achievement."¹⁵

Purpose and Problem of The Study

National standardization of the Iowa Tests of Music Literacy took place in the Fall of 1970. Students who participated in the standardization program were enrolled

¹⁴Edwin Gordon, Musical Aptitude Profile (Boston, Mass.: Houghton Mifflin Co., 1955).

¹⁵Gordon, ITML Manual, pp. 1-2.

in schools which were geographically distributed and which were in cities of various sizes. Single Levels of the tests were administered to participating groups comprising over 18,000 students in all. From these data, norms were developed for three grade ranges. For the upper elementary grades (4, 5, and 6), norms were established only for Levels 1, 2, and 3 of the battery. For the junior high school grades (7, 8, and 9), and also for the senior high school grades (10, 11, and 12), norms were established for the complete battery, Levels 1 through 6.

Although publication of ITML has been recent, five¹⁶ validity-related studies of the tests have been

¹⁶Validity-related studies of ITML:

1) Warren C. Swindell, "An Investigation of the Adequacy of the Content and Difficulty Levels of the Iowa Tests of Music Literacy" (Ph.D. Thesis, The University of Iowa, 1970).

2) Stanley Schleuter, "An Investigation of the Interrelation of Personality Traits, Musical Aptitude and Musical Achievement," Studies in the Psychology of Music 8 (Iowa City: The University of Iowa, 1972), pp. 90-102.

3) Robert W. Thayer, "An Investigation of the Interrelation of Personality Traits, Musical Achievement, and Different Measures of Musical Aptitude," Studies in the Psychology of Music 8 (Iowa City: The University of Iowa, 1972), pp. 103-118.

4) James L. Mohatt, "A Study of the Validity of the Iowa Tests of Music Literacy," Studies in the Psychology of Music 7 (Iowa City: The University of Iowa, 1971), pp. 144-167.

completed thus far. However, there remain questions of importance to the test user which require investigation. For example, the author has published six sequential Levels of ITML. No grade has been designated, however, as most appropriate for a particular Level of the battery. Selection of a Level suitable for use for a given grade is at the discretion of the instructor. The author states in the Manual:

"There are six Levels of the Iowa Tests of Music Literacy (each of which contains six subtests). The six subtests are titled the same from Level to Level because they are designed to measure parallel concepts at each Level. The content of the six subtests becomes more complex from Level 1 through Level 6. However, it is not necessary to administer the various Levels of the battery sequentially. That is, students need not take Level 1 before any other Level. Moreover, a Level may be skipped if the teacher considers a more advanced Level appropriate to students' musical understanding. The comprehensive nature of the tape-recorded directions and practice exercises makes each Level self-explanatory."¹⁷

5) Roger V. Foss, "An Investigation of the Effect of the Provision of the 'In-Doubt' Response on the Validity of the Iowa Tests of Music Literacy," (Ph.D. Thesis, The University of Iowa, 1972).

¹⁷Gordon, ITML Manual, p. 2.

Because no evidence has been given in the ITML Manual to support this statement, it seems that the above assertion by the author could represent a questionable assumption. The use of ITML to accommodate teaching to individual students' musical needs presupposes a teacher's confidence in the validity and applicability of the norms for the purpose of evaluating students' test results. It is quite conceivable that a teacher might initially administer a lower Level of ITML to the class. Should this Level not discriminate well because it is too easy, it is plausible that a higher Level would be administered as a consequence. In such a case, "learning effects" could accrue which might produce spuriously high scores. The term "learning effects" as used in this study, refers to the possibility that learning could result from exposure to the test content in the sense that prior exposure to a lower Level of ITML might constitute a program for learning sequential musical concepts embodied in higher Levels of the battery.

Also, the possibility cannot be overlooked that learning could result from experience with the tape-recorded directions or the form of the answer sheets used on the lower Level of ITML. Although the author states

that each Level is "self-explanatory" by virtue of the "comprehensive nature" of the directions and practice exercises, it is obvious that features unique to the design of the ITML battery and to the process of taking the subtests are paralleled within each division and throughout the six Levels of the battery.

In the event that "learning effects" might be peculiar to the structure of ITML, either related to the musical content of the subtests or to testing procedures, such "learning effects" could impair the use of test results in that they might be misleading. Should such "learning effects" exist, the author may wish to offer supplementary norms for ITML. Objective evidence that having taken a given subtest before a parallel subtest at a higher Level does, or does not, affect test scores, would, in either case, be of both practical and theoretical interest.

The overall purpose of this study was to investigate whether "learning effects" might accrue from an initial administration of a Level of ITML which could increase a student's score on a higher Level of the test battery. The specific problem of the study was to investigate whether subtest scores on any Level of ITML higher than