

AN INVESTIGATION OF THE RELATIVE AND COMBINED POWER
OF MUSICAL APTITUDE, GENERAL INTELLIGENCE,
AND ACADEMIC ACHIEVEMENT TESTS
TO PREDICT MUSICAL ATTAINMENT

by

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CHAPTER I

INTRODUCTION TO THE STUDY

The identification of musically talented children has been a subject of concern to American psychologists and music educators since the early part of this century. Prior to the third decade of the century, the most commonly employed method of identifying such children was through subjective judgment. However, the adequacy of this type of assessment is directly dependent upon teachers' capabilities, insights, and experience. Some of the obvious disadvantages of this approach are the wide variation in standards and the tendency for extra-musical factors to influence teachers' decisions. The subjective method, although now used somewhat less extensively than formerly, is still employed in many schools as a means of evaluating the musical aptitudes of children.

In an effort to eliminate disadvantages of subjective judgments, various standardized tests have been developed. These batteries, in general, are designed to measure certain attributes which each test writer deems to be of importance for indicating the amount of musical intelligence, or aptitude, which a particular child is thought to

possess. The principal advantage of the standardized test over the subjective judgment is that the former is designed to yield more consistent and objectively interpretable results.

One of the earliest researchers in the field of musical aptitude testing was the psychologist Dr. C.E. Seashore, of the University of Iowa. In 1919, the Seashore Measures of Musical Talent were published,¹ and later, in 1930, the Kwalwasser-Dykema Music Tests were released.² Since then, several music aptitude tests have been developed of which the more widely used are those authored by Drake,³ Gaston,⁴ Gordon,⁵ and Wing.⁶

Primarily because of the limitations of subjective judgment, aptitude tests have been gaining increased recognition, particularly

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Carl E. Seashore, Measures of Musical Talent. (New York: Columbia Phonograph Company, 1919).

2

Jacob Kwalwasser and Peter Dykema, Kwalwasser-Dykema Music Tests. (New York: Carl Fischer, Inc. 1930).

3

Raleigh M. Drake, Drake Musical Aptitude Test. (Chicago: Science Research Associates, 1954).

4

Thayer Gaston, A Test of Musicality. (Lawrence, Kansas: Odell's Instrumental Service, 1957).

5

Edwin Gordon, Musical Aptitude Profile. (Boston: Houghton Mifflin Company, 1965).

6

Herbert Wing, Standardized Tests of Musical Intelligence. (Sheffield, England: City of Sheffield College, 1958).

in the last decade. Additional pressures for objective evaluation have arisen as a result of overcrowded school curriculums, increased specialization by students, less teacher-student contact time, the mounting demand for students' time from areas other than music, and the rising cost of musical instruction. Relevant to this, it was reasoned that the possible derivation of a reliable and objective method for predicting musical success could greatly facilitate the guidance function of both school counselors and practicing music teachers.

The Problem

The problem of this study was to investigate the relative and combined power of three types of standardized tests for predicting success in a music program. These types included tests of general intelligence, academic achievement, and musical aptitude.

Rationale of the Study

In a recently published longitudinal predictive validity study,⁷ the relationship between musical aptitude and musical achievement was investigated. In that study, all enrolled students in selected fourth and fifth grade elementary classrooms were given instrumental training.

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Edwin Gordon, A Three-year Longitudinal Predictive Validity Study of the Musical Aptitude Profile. Vol. V: Studies in the Psychology of Music. (Iowa City, Iowa: University of Iowa Press, 1967).

Prior to the initiation of training, the Musical Aptitude Profile was administered. After a three-year training period, a written music achievement test and a performance test were administered to the students. The scores from these measures were combined with teachers' ratings of the students' progress into a composite unweighted criterion score of musical achievement. These scores were then correlated with pre-training musical aptitude scores with a resulting predictive validity coefficient of .75.

Despite this high validity coefficient, it seems reasonable to assume that there are other factors, in addition to musical aptitude, that may have some implications for the level of the student's musical attainment. Some of these might be quantity and quality of training, home environment, school musical experience, student interest, general intelligence, and academic achievement. The relationship of general intelligence to musical achievement was the subject of investigation by ⁸ Rainbow. Using scores from a group of ninety-one elementary children, he found a correlation of .48 between the Lorge-Thorndike Intelligence Test and selected subtests from the Kwalwasser-Ruch Test of Musical Accomplishment. In another study, Rhoades used intelligence scores to

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Edward L. Rainbow, "A Pilot Study to Investigate the Constructs of Musical Aptitude," (Unpublished dissertation, University of Iowa, 1965). P. 106.

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predict musical success with a resulting coefficient of .55. These coefficients are representative of the degree of relationship which is generally found to exist between these two factors. Rainbow also investigated the relationship between music achievement and academic achievement and found a correlation coefficient of .61. The criteria in this instance were selected subtests from the Kwalwasser-Ruch battery and the Iowa Tests of Basic Skills.¹⁰

These reported relationships of musical aptitude, general intelligence and academic achievement to various criteria of musical achievement may be regarded as moderately high. However, it is of interest to note that although the relationship between Musical Aptitude Profile scores and intelligence test scores is positive, it is comparatively low, ranging from .19 to .40, with a median of .32 for students in grades four through six.¹¹ As might be expected, the relationship between the factors of intelligence and academic achievement is relatively high. The authors of the Lorge-Thorndike test report a correlation of

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Fordyce L. Rhoades, "An Evaluation of Measures for the Prediction of Success in Instrumental Study," (Unpublished thesis, University of Washington, 1938).

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Rainbow, p. 107.

11

Edwin Gordon, Musical Aptitude Profile, Manual. (Boston: Houghton Mifflin Company, 1965). P. 64.

.84 between their battery and the Iowa Tests of Basic Skills,¹² while the authors of the latter test report a coefficient of .89 between the two measures.¹³ In an independent study, Knief substantiated these figures by reporting a correlation of .85.¹⁴ In Figure 1, the general magnitude of these various relationships is illustrated.

The low relationship of musical aptitude with intelligence, and with academic achievement, and the comparatively high relationship of each of these latter factors with musical achievement, suggests the possibility that general intelligence and academic achievement may have variance in common with musical achievement which is not accounted for in musical aptitude tests. If this is, in fact, true, it is possible that these three factors, when combined in an optimal way, could be used to predict music achievement with greater accuracy than could any of the three tests when used independently.

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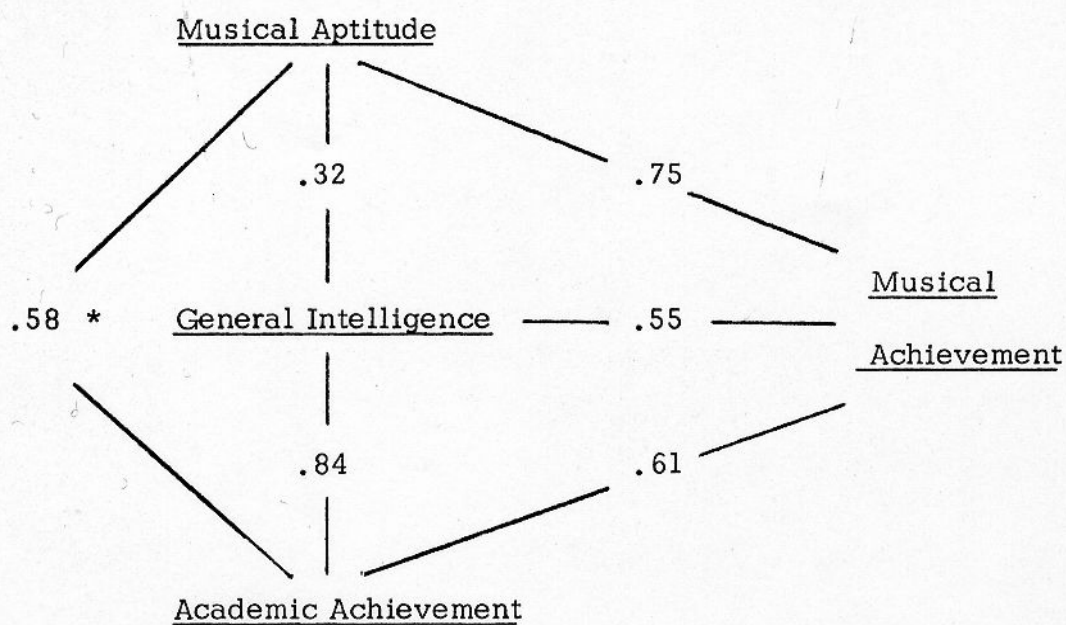
Irving Lorge and Robert L. Thorndike, Lorge-Thorndike Intelligence Test, Technical Manual. (Boston: Houghton Mifflin Company, 1962). P. 16.

13

E.F. Lindquist and A.N. Hieronymus, Iowa Tests of Basic Skills, Manual. (Boston: Houghton Mifflin Company, 1964). P. 4, Norms Tables.

14

Lotus Knief, "An Investigation of the Cultural Bias Issue in Intelligence Testing." (Unpublished dissertation, University of Iowa, 1957).



* The correlation between musical aptitude and academic achievement was obtained from: Edwin Gordon, Musical Aptitude Profile, Manual. (Boston: Houghton Mifflin Company, 1965). P. 64.

Figure 1.

CORRELATIONS BETWEEN MUSICAL APTITUDE, INTELLIGENCE, ACADEMIC ACHIEVEMENT, AND MUSICAL ACHIEVEMENT

Description of Tests Used in the Study

The following three standardized tests were selected for use in this study because they were among the most valid instruments of their respective types available at the time of the investigation.

1. Musical Aptitude Profile. Developed by Edwin Gordon, University of Iowa. Published by Houghton Mifflin Company.

MAP is a tape recorded objective test which measures three basic dimensions of musical aptitude.

Test T - Tonal Imagery: consisting of two subtests, (T-1 Melody, and T-2 Harmony).

Test R - Rhythm Imagery: consisting of two subtests, (R-1 Tempo, and R-2 Meter).

Test S - Musical Sensitivity: consisting of three subtests, (S-1 Phrasing, S-2 Balance, and S-3 Style).

The entire battery consists of two-hundred fifty original short selections composed by the author for violin and cello. Test reliabilities for the grade level used in this study are: subtests, .68 to .76; total tests, .81 to .85; and the complete battery, .91. In his discussion of the

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MAP battery, Lehman says,

The Musical Aptitude Profile is particularly notable for the thoroughness and care that have characterized its preparation. It is definitely one of the most important contributions to the continuing study of musical aptitude.

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Paul R. Lehman, Tests and Measurements in Music. (Englewood Cliffs, N.J: Prentice-Hall, Inc. 1968). P. 54.

2. Lorge-Thorndike Intelligence Test, Level Two. Developed by Irving Lorge and Robert L. Thorndike, Teachers College Columbia University. Published by Houghton Mifflin Company.

This battery consists of three non-reading subtests of Oral Vocabulary, Picture Classification, and Pictorial Pairing. The reliability of the total battery for the level used in this study is .76. Milholland, 16 in a review of this test says,

The Lorge-Thorndike tests should be accorded a place among the best of our group intelligence tests.

3. Iowa Tests of Basic Skills. Prepared at the University of Iowa under the direction of E. F. Lindquist and A. N. Hieronymus. Published by Houghton Mifflin Company.

The ITBS battery is a measure of academic achievement and provides assessment in the following five areas.

Test V - Vocabulary.

Test R - Reading Comprehension.

Test L - Language Skills. (Spelling, Capitalization, Punctuation, and Usage).

Test W - Work-study Skills. (Map reading, Reading graphs and tables, and Knowledge of reference materials).

Test A - Arithmetic Skills. (Arithmetic concepts, and Arithmetic problem solving).

The battery emphasizes the measurement of functional skills, that is, the general intellectual skills and abilities needed by a child for satisfactory progress in school.¹⁷ The reliabilities for the level used in this study range from .89 to .96 for the total tests and .98 for the entire battery.¹⁸ Concerning the ITBS Herrick says, "...the tests, for their purposes, are among the best available at this time," while the British educator Morgan writes, "...this reviewer would strongly recommend the tests as a whole as the best of their kind."¹⁹

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Robert L. Thorndike and Elizabeth Hagen, Measurement and Evaluation in Psychology and Education, second edition. (New York: John Wiley and Sons, 1961). P. 582.

18

Virgil E. Herrick, "Iowa Tests of Basic Skills," a review in Fifth Mental Measurements Yearbook. ed. by Oscar K. Buros (Highland Park, N.J: Gryphon Press, 1959). P. 16.

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G. A. V. Morgan, "Iowa Tests of Basic Skills," a review in Fifth Mental Measurements Yearbook, ed. by Oscar K. Buros (Highland Park, N.J: Gryphon Press, 1959). P. 16.