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**Predictive Validity
Study of
AMMA**

Edwin E. Gordon

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**A One-Year Longitudinal
Predictive Validity Study of
the Advanced Measures
of Music Audiation**

by

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A ONE-YEAR LONGITUDINAL PREDICTIVE VALIDITY STUDY OF THE ADVANCED MEASURES OF MUSIC AUDIATION

Introduction

The *Seashore Measures of Musical Talent*, the first standardized test of music aptitude, was published in 1919. It was designed for students in the elementary grades through high school. During the following forty years, numerous tests of music aptitude were published in America and abroad. Not one was designed for college and university students. It was not until almost seventy years after Seashore's test that the first music aptitude test was conceived specifically for college and university students. That test, the *Advanced Measures of Music Audiation*, was published in 1989.¹

Not all of the early music aptitude tests proved to be valid. There have been sufficient research and critical writing, however, to support the belief that results derived from the more recently published tests may be used to improve instruction. Through the use of a valid music aptitude test, students who are most likely to benefit from music instruction may be identified objectively. Also, the comparative musical strengths and weaknesses of each student may be compared objectively so that music instruction may be adapted to his or her individual music needs. Prediction and diagnosis, of course, need not be accomplished at the expense of denying music instruction to any student who desires it. Why is it then that a valid music aptitude test has not been written sooner for college and university students? Though numerous reasons might be cited, two seem to be conspicuous.

First, the majority of college and university administrators and professors believe that they are more capable than any test of recognizing "musical talent" or "musical ability." They typically are not aware of the difference between music aptitude and music achievement. Music aptitude is a measure of what a student can learn. Music achievement is a measure of what a student has learned. The words "talent" and "ability" lack specific meaning, because they combine, and thus confuse, aptitude and achievement. Because teachers can only guess a student's potential on the basis of the student's achievement, music aptitude becomes of secondary importance in their thinking. Moreover, while it is true that a student who demonstrates a high level of music achievement must have a high level of music aptitude, it is not true that a student who demonstrates a low level of music achievement must have a low level of music aptitude. It has been found that almost half the number of students in the public schools who possess high levels of music aptitude demonstrate little or no music achievement. It is possible that a student who has a high level of music aptitude and demonstrates comparatively little music achievement may become a better musician than a student who has a lower level of music aptitude and demonstrates some music achievement. In the process of admitting a student to a music degree program, a music aptitude test can play an important role as an objective aid to a teacher's subjective opinion. Certainly,

1. Edwin E. Gordon, *Advanced Measures of Music Audiation* (Chicago: GIA, 1989).

using subjective opinion and objective facts together would engender greater confidence in college and university admission procedures than using either one alone.

Second, the results of several published and unpublished studies appear to support the belief of the majority of college and university professors and administrators that music aptitude tests are ineffective when used with college and university students. Those studies themselves lack credibility. For example, consider the following passage quoted from the conclusions and recommendations section of the most recent of such studies.²

Findings from the prediction portion of this study indicate that the best predictors of achievement in freshman music theory are measures of academic ability and achievement, as well as categorical measures of music experience that indicate the incidence of piano study, principal instrument, and performance on more than one instrument. As such, the findings are consistent with those of other researchers who reported that these factors were better predictors of music achievement than music aptitude when all were included in the study.

Harrison's findings should come as no surprise. Because grades in music theory are based more on part-writing skill than on audiation skill, it does not require research to discover that there is a greater correspondence between the grades that a student receives in music theory and his scores on academic ability and achievement tests than between the grades that a student receives in music theory and his scores on a music aptitude test. It is possible for a student to learn part writing rules very well and still not be able to audiate what he has written. (Audiation is the ability to hear and to *comprehend* music for which the sound is not physically present.) It is also possible for a student to learn to audiate very well and not to learn part writing rules. In a word, the validity criterion that Harrison chose is not itself valid. Moreover, the majority of grades typically given in music theory courses are A's and B's. As a result of that restricted variability, the correlation between those grades and scores on an objective test essentially becomes bi-serial. Under usual conditions, a bi-serial correlation yields a lower coefficient in association with a shortened test than does a zero-order correlation. Perhaps Harrison's conclusions should not be given serious consideration because the music aptitude test that she used was not designed for use with college and university students. The *Musical Aptitude Profile* was standardized with students in grades four through twelve. Harrison not only adapted the test and test directions, but also she did not administer the test in accordance with the directions in the test manual. It makes little sense to compare the efficacy of two tests under circumstances in which one test was not designed to function.

The present study was undertaken to investigate the validity of the *Advanced Measures of Music Audiation*, a recently published music aptitude test that is specifically designed for use with college and university students. Once the longitudinal predictive validity of the *Advanced Measures of Music Audiation* has been established, using mu-

2. Carole S. Harrison, "Predicting Music Theory Grades: The Relative Efficiency of Academic Ability, Music Experience, and Musical Aptitude," *Journal of Research in Music Education* 38, 2 (1990), pp. 124-137.

sic performance as a validity criterion, it is anticipated that a study of the comparative power of it and tests of academic ability and achievement to predict success in a music degree programs will be undertaken.

Description of the Advanced Measures of Music Audiation

The *Advanced Measures of Music Audiation* is a cassette recorded test that requires approximately 15 minutes to administer. Included are 30 questions, each containing a pair of short music phrases. In addition to the test questions, directions for taking the test, along with practice examples, are recorded on the cassette. The test may be administered to groups or individuals.

Because the *Advanced Measures of Music Audiation* is a music aptitude test, formal music achievement is not a requirement for taking the test. Whether or not a student can play a music instrument, sing, or read notation, or has taken courses in music theory, he or she may score high on the test. The student simply indicates by filling a space on the computer-scorable answer sheet whether two short music phrases sound the same, whether they sound different because of a tonal change, or whether they sound different because of a rhythm change. There is only one correct answer for each question. Students are urged not to guess answers.

Procedures and Design of the Study

During the month of September, 1989, the *Advanced Measures of Music Audiation* was administered to all 225 undergraduate and graduate members of the orchestra, concert choir, and band of the Esther Boyer College of Music of Temple University. There were 90 students in the orchestra, 46 in the concert choir, and 89 in the band. Each group included freshman through doctoral students.³

During the first week of May, 1990, all students to whom the *Advanced Measures of Music Audiation* had been administered in September, 1989, who were taking jury examinations were asked to perform a short etude. The students were given the etude approximately ten days before they were to record it. The etude constituted the validity criterion in the study.⁴ To equalize the difficulty of the etude for all students to the greatest extent possible, the composer wrote it in the most appropriate key for every orchestral and band instrument, every voice, and piano. The various transcriptions of the etude are presented in Appendix A.

Of the 225 students who took the *Advanced Measures of Music Audiation* in 1989, slightly more than half, 114, recorded the etude in May, 1990. The reasons for the decrease in participation may be that 1) approximately one third of the students were not

3. It was found in the standardization program of the *Advanced Measures of Music Audiation* that neither chronological age nor years of music training are related to scores on the test. That finding, which indirectly bears on the validity of the test, strongly suggests that the *Advanced Measures of Music Audiation* is a music aptitude test and not a music achievement test.

4. The etude was composed by Professor Maurice Wright, Chairman of the Composition Department and Director of Studies in Computer Music in the Esther Boyer College of Music of Temple University.

music majors, and thus they did not take jury examinations, 2) some students performed recitals and therefore were not required to take jury examinations, 3) percussion students did not take jury examinations at the regularly scheduled times, and 4) some students who did take jury examinations exercised their rights under the HRS Regulations (Protection of Human Research Subjects) and chose not to record the etude. Nevertheless, the 114 students who did record the etude provided more than adequate variability in their *Advanced Measures of Music Audiation* scores and etude performance ratings for the statistical analyses to be undertaken.

The media of performances represented in the recorded etudes were female and male voices, piano, violin, viola, cello, recorder, clarinet, bassoon, French horn, saxophone, trumpet, trombone, baritone, euphonium, and tuba. The majority of piano majors were members of the concert choir.

Over a period of one week, the writer cassette-recorded each student's performance of the etude in a private room during the same time at which the jury examinations were taking place. Students came to the recording site either before or after their jury examinations. No student's name was announced on the recording. For record keeping, only an ID number for each student and his or her medium of performance was announced before each recording was made.

Over a period of one month, three judges independently evaluated the recorded performances of the students' etudes.⁵ Each judge used rating scales with three dimensions. They were Dimension 1 - Tonal or Instrumental Technique, Dimension 2 - Rhythm, and Dimension 3 - Expression. All dimensions were based on five points. Thus each judge could award a student as many as 15 points. That allowed each student to receive a total possible rating of 45 points from the combined ratings of the three judges.

The same rating scale was used to assess the etude performance of all voice students and all students who played any orchestra or band instrument. Another rating scale was used with piano students. The Rhythm dimension and the Expression dimension of the two rating scales were the same. Because the Tonal dimension of the primary rating scale was based on intonation, its use for piano would, of course, have been inappropriate. It was replaced with an Instrumental Technique dimension. The Tonal and Rhythm dimensions of the primary rating scale were continuous. That is, a student could not be awarded a 2 unless he or she also achieved a 1; he or she could not be awarded a 3 unless he or she also achieved a 2; and so on. The Expression dimension of the primary rating scale was additive. That is, a student might be awarded as many points as he or she achieved criteria on the dimension. The Rhythm dimension of the other rating scale that was used with piano students also was continuous. The Expression and Instrumental Technique dimensions of the other rating scale were additive. All rating scales are presented in Appendix B.

5. The three judges were Ruth Wright, Roger A. Dean, and the writer. Ruth Wright is a violist currently freelancing in the Philadelphia area. She is a member of the Davidsbund Chamber Players. She has performed with The Pennsylvania Ballet, The Pennsylvania Opera Theater, and the Opera Company of Philadelphia. Roger A. Dean is Chairman and Professor of Music Education in the Esther Boyer College of Music of Temple University. Edwin E. Gordon is Professor of Music in the Esther Boyer College of Music of Temple University. He holds the Carl E. Seashore Chair for Research in Music Education.

The most important analysis in the study is the relationship between the students' *Advanced Measures of Music Audiation* scores at the beginning of the academic year and their etude performance scores at the end of the academic year. Those correlations are a measure of the longitudinal predictive validity of the *Advanced Measures of Music Audiation*. For freshman, the correlations bear on the validity of the *Advanced Measures of Music Audiation* in predicting success for students without previous college and university music instruction. For upper classmen and graduates, the correlations bear on the validity of the *Advanced Measures of Music Audiation* in predicting further success for students who have had various degrees of college and university music instruction. In addition to the predictive validity coefficients, relevant information, such as means, standard deviations, and reliabilities, is reported in the following section.

Results of the Study

Means, Standard Deviations, Intercorrelations, and Reliabilities

Although the *Advanced Measures of Music Audiation* constitutes only one test, as a result of a unique scoring procedure it yields three scores: a *Tonal* score, a *Rhythm* score, and a *Total* score. The *Total* score is the combined *Tonal* and *Rhythm* scores. The three means and standard deviations for all members of the orchestra, concert choir, and band who took the test in September, 1989 are reported in Table 1. It will be noticed that the means for the orchestra and concert choir are higher than those for the band. The reason is that the band included many non-music majors. It was found in the standardization program of the *Advanced Measures of Music Audiation* that, in terms of groups, non-music majors score significantly lower than music majors. As a result, there are separate norms for music and non-music majors.⁶

Even though some of the members were non-music majors, the means for the three performance groups combined are higher than those derived in the national standardization of the test for music majors.⁷ There are practically no differences in the standard deviations. The mean is 1.3 higher for the Tonal test, .2 higher for the Rhythm test, and 1.5 higher for the Total test. Considering that the highest possible score is 40 on the Tonal and Rhythm tests and 80 on the Total test, however, the differences are inconsequential.

6. It may be questioned why, if the *Advanced Measures of Music Audiation* is indeed a music aptitude test and if formal music instruction is not necessary to score high on the test, music majors as a group score higher on the test than non-music majors. The reason is that more persons who have high levels of music aptitude seek formal music instruction than do persons who have low levels of music aptitude.

7. Standardization data referred to throughout this paper, as well as other technical information about the test, may be found in the test manual: Edwin E. Gordon, *Manual for the Advanced Measures of Music Audiation* (Chicago: GIA, 1989), Part 7, pp. 36-53.

Table 1
ADVANCED MEASURES OF MUSIC AUDIATION MEANS AND STANDARD DEVIATIONS FOR ALL MEMBERS OF THE ORCHESTRA, CONCERT CHOIR, AND BAND

	Means	Standard Deviations
Orchestra		
Tonal	30.9	3.99
Rhythm	32.3	3.07
Total	63.2	6.74
Concert Choir		
Tonal	30.4	4.45
Rhythm	32.4	3.40
Total	62.8	7.50
Band		
Tonal	27.1	4.12
Rhythm	29.0	3.83
Total	56.1	7.59
All Groups Combined		
Tonal	29.6	4.21
Rhythm	31.0	3.62
Total	60.6	7.33

Table 2
ADVANCED MEASURES OF MUSIC AUDIATION MEANS AND STANDARD DEVIATIONS FOR ONLY STUDENTS WHO RECORDED THE ETUDE

	Means	Standard Deviations
Tonal	31.4	4.70
Rhythm	31.9	3.91
Total	63.3	8.02

The *Advanced Measures of Music Audiation* means and standard deviations for only those students who recorded the performance etude in May, 1990 are reported in Table 2. A comparison of those means with those for the total group indicates that the students who recorded the performance etude possess higher levels of tonal and rhythm aptitude. The Tonal test mean is 3.1 higher, the Rhythm test mean is 1.1 higher, and the Total test mean is 4.2 higher. It may be that students with higher levels of music aptitudes are more confident and more willing to perform than students with lower levels of music aptitudes. Nevertheless, the comparisons of the *Advanced Measures of Music Audiation* means and standard deviations for the standardization group, the total group, and the group that recorded the performance etude indicate that the range of music aptitude scores of the 114 students who recorded the performance etude is sufficient for computing correlations.

The *Advanced Measures of Music Audiation* split halves reliabilities and intercorrelations based on the scores of the total group of 225 students are reported in Table 3. The reliabilities are in parentheses.⁸ The data are nearly the same as the those for the standardization group. The reliabilities for the standardization group were .84, .85, and .88 for the *Tonal*, *Rhythm*, and *Total* tests, respectively. The intercorrelation between the *Tonal* and *Rhythm* tests was .78 for the standardization group.

Table 3

ADVANCED MEASURES OF MUSIC AUDIATION RELIABILITIES AND INTERCORRELATIONS FOR ALL MEMBERS OF THE ORCHESTRA, CONCERT CHOIR, AND BAND

	Tonal	Rhythm	Total
Tonal	(.83)	.73	.94
Rhythm	.73	(.86)	.92
Total	.94	.92	(.88)

The means and standard deviations of the judges' ratings of the students' performances of the recorded etude are reported in Table 4. Given a theoretical mean of 3.0 for each dimension of the rating scale, 9.0 for the three dimensions combined, and 27.0 for all of the ratings of all of the judges, it is obvious that the judges were able to discriminate well among the students' levels of performance of the etude. Moreover, the judges appear to have exercised similar standards when evaluating the etude performances. The standard deviations, on the other hand, are approximately twice as large as they should be. The theoretical standard deviation for each dimension of the rating scale is .67, 2.00 for the three dimensions combined, and 6.00 for all of the ratings of all of the

8. How the tests were divided to compute the split halves reliabilities is explained on page 41 of the *Manual for the Advanced Measures of Music Audiation*.

judges. The larger-than-expected standard deviations are largely due to the fact that the distributions of the ratings were somewhat skewed to the left.

Table 4

MEANS AND STANDARD DEVIATIONS OF THE JUDGES' RATINGS OF THE STUDENTS' PERFORMANCES OF THE RECORDED ETUDE

	Means	Standard Deviations
Judge 1		
Dimension 1	3.4	1.52
Dimension 2	3.2	1.28
Dimension 3	2.6	1.25
All Dimensions Combined	9.2	3.35
Judge 2		
Dimension 1	3.2	1.45
Dimension 2	3.1	1.31
Dimension 3	2.8	1.27
All Dimensions Combined	9.1	3.72
Judge 3		
Dimension 1	3.2	1.33
Dimension 2	3.2	1.32
Dimension 3	2.8	1.19
All Dimensions Combined	9.2	3.40
All Judges Combined		
Dimension 1	9.8	4.12
Dimension 2	9.5	3.96
Dimension 3	8.2	3.40
All Dimensions Combined	27.5	10.83

The reliabilities of each pair of judges' ratings of the students' performances of the recorded etude are reported in Table 5. Overall, any one pair of judges seems to have agreed on their evaluations of the students' etude performances about as well as either of the other two pairs. Although having a third judge may appear to have been unnecessary, it can be seen in Table 5 that for each dimension of the rating scale, the reliabilities of the ratings for the three judges combined are systematically higher than the reliabilities for any pair of judges.

The reliability of all judges combined for all ratings combined is substantial. Nevertheless, it is lower than the reliability of all judges combined for Dimension 1 alone.

Perhaps that is a result of the relationship of Dimension 1 to instrumental technique for piano, or of a lack of the clarity of the criteria on the rhythm and expression dimensions which would have enabled the judges to make more precise evaluations, or both.

Table 5
RELIABILITIES OF THE JUDGES' RATINGS OF THE STUDENTS'
PERFORMANCES OF THE RECORDED ETUDE

Judges 1 and 2	
Dimension 1	.90
Dimension 2	.69
Dimension 3	.56
All Dimensions Combined	.78
Judges 1 and 3	
Dimension 1	.87
Dimension 2	.50
Dimension 3	.58
All Dimensions Combined	.74
Judges 2 and 3	
Dimension 1	.86
Dimension 2	.59
Dimension 3	.64
All Dimensions Combined	.80
All Judges Combined	
Dimension 1	.91
Dimension 2	.70
Dimension 3	.66
All Dimensions Combined	.84

The intercorrelations of all of the judges' ratings combined for each dimension and for all of the dimensions combined are reported in Table 6. It can be seen that the intercorrelation coefficients are about as high as the reliability coefficients. That is, the relationship of one judge's tonal ratings with his or her own rhythm ratings is not materially different from the relationship of one judge's tonal ratings with the tonal ratings of another judge.

Validity

The longitudinal predictive validity of the *Advanced Measures of Music Audiation* is reported in Tables 7 and 8. The correlations between the students' *Advanced Measures of Music Audiation* scores and each judge's evaluations of the students' etude performances in terms of all of the rating scale dimensions combined are presented in Table 7. The correlations between the students' *Advanced Measures of Music Audiation* scores and all of the judges' combined evaluations on each dimension and of the combined dimensions of the rating scale are presented in Table 8.

Table 6

INTERCORRELATIONS OF THE COMBINED JUDGES' RATINGS OF THE STUDENTS' PERFORMANCES OF THE RECORDED ETUDE

	Dimension 1	Dimension 2	Dimension 3	All Dimensions Combined
Dimension 1		.67	.63	.88
Dimension 2	.67		.77	.89
Dimension 3	.63	.77		.87
All Dimensions Combined	.88	.89	.87	

Table 7

LONGITUDINAL PREDICTIVE VALIDITY: CORRELATIONS BETWEEN EACH JUDGE'S RATINGS OF ALL DIMENSIONS COMBINED OF THE STUDENTS' ETUDE PERFORMANCES AND THEIR SCORES ON THE ADVANCED MEASURES OF MUSIC AUDIATION

Advanced Measures of Music Audiation	Judges		
	1	2	3
Tonal	.74	.76	.70
Rhythm	.71	.74	.69
Total	.80	.81	.76

Table 8

LONGITUDINAL PREDICTIVE VALIDITY: CORRELATIONS BETWEEN THE COMBINED JUDGES RATINGS OF DIFFERENT AND COMBINED DIMENSIONS OF THE STUDENTS' ETUDE PERFORMANCES AND THEIR SCORES ON THE ADVANCED MEASURES OF MUSIC AUDIATION

	Tonal	Rhythm	Total
Dimension 1	.69	.65	.72
Dimension 2	.66	.67	.73
Dimensions 1 and 2	.75	.73	.80
Dimension 3	.65	.61	.69
All Dimensions Combined	.77	.75	.82

As can be seen in Table 7, any of the judges' evaluations resulted in about the same degree of longitudinal predictive validity for the *Advanced Measures of Music Audiation* as either of the other two judges' evaluations. The evaluations of any one of the judges without the evaluations of the other two would have been sufficient. Those results are encouraging considering that the various judges have diverse music backgrounds and experiences. As would be expected, the longitudinal predictive validity for the *Total* test of the *Advanced Measures of Music Audiation* is higher than that for either the *Tonal* test or the *Rhythm* test.

Table 8 offers the most important statistic of the study. It can be seen that the longitudinal predictive validity coefficient in terms of the correlation of Total scores on the *Advanced Measures of Music Audiation* with the judges' combined ratings of the combined dimensions of the rating scale is .82. In simplified terms, the coefficient of .82 indicates that more than 67 percent (the square of .82) of the reason or reasons for college students' success in music performance can be predicted by Total test scores on the *Advanced Measures of Music Audiation*. College students' success in tonal aspects of their performance can be predicted with more than 59 percent accuracy. Their success in rhythm aspects of their performance can be predicted with more than 56 percent accuracy. The predictive validity coefficient of the *Total* test of the *Advanced Measures of Music Audiation* is highly similar to the longitudinal validity coefficient found for the *Musical Aptitude Profile*⁹ and the *Instrument Timbre Preference Test*¹⁰ combined in predicting students' success in instrumental music instruction in the elementary school.¹¹

There is approximately 67 percent in common between success in college music performance and Total scores on the *Advanced Measures of Music Audiation*. What constitutes the remaining 33 percent of the variance is of interest. By correcting the longitudinal predictive validity of .82 for attenuation, it is found that 28 percent of that

9. Edwin E. Gordon, *Intermediate Measures of Music Audiation* (Chicago: GIA, 1982).

10. Edwin E. Gordon, *Instrument Timbre Preference Test* (Chicago: GIA, 1986).

11. Edwin E. Gordon, *Predictive Validity Studies of IMMA and ITPT* (Chicago: GIA, 1989).

variance is a result of unreliability associated with the judges' evaluations of the students' etude performances in conjunction with the less-than-perfect reliability associated with the *Total* test of the *Advanced Measures of Music Audiation*. The nature of the remaining five percent of the variance remains unknown.

It will be noticed in Table 8 that predictive validity coefficients are reported for the rating scale in terms of Dimensions 1 and 2 combined as well as for each dimension separately and for all dimensions combined. The analysis may be of interest to the reader. For purposes of future research, it seemed desirable to determine whether an expression dimension is a necessary part of a rating scale. It was discovered that the expression dimension accounted for a slight amount of the variance. The use of the expression dimension increased the demonstrated longitudinal predictive power of the *Total* test of the *Advanced Measures of Music Audiation* by three percent.

The correlations of the *Tonal* test of the *Advanced Measures of Music Audiation* of .69 and .65 with Dimensions 1 and 2, respectively, and the correlation of the *Rhythm* test of the *Advanced Measures of Music Audiation* of .66 and .67 with Dimensions 1 and 2, respectively, suggest that scores on either the *Tonal* test or the *Rhythm* test may be used to predict success in tonal aspects of performance as well as success in rhythm aspects of performance. Because of the unique procedure for scoring the *Advanced Measures of Music Audiation*, the intercorrelation of the *Tonal* test and the *Rhythm* test is expected to be high. As can be seen in Table 3, it was found to be .73. High as that is, there should have been enough unique variance associated with each test to provide for more specific diagnostic capabilities. The reason for that lack of specificity has to do with the content of the rating scale, how the judges interpreted that content, the composition of the etude, or possibly with all three. Nevertheless, given the intercorrelation .73 and the reliabilities .83 for the *Tonal* test and .86 for the *Rhythm* test, the amount of unique variance associated with the two tests is approximately 14 percent. The unreliability of the judges' ratings in conjunction with that of the *Advanced Measures of Music Audiation* reduced the unique variance to approximately 11 percent. That variance obviously was not sufficiently broad to allow each test to demonstrate unique diagnostic properties.

To describe the longitudinal predictive validity of the *Advanced Measures of Music Audiation* in more practical terms, a final analysis of the relationship between the students' *Total* test scores and the combined judges' ratings of their etude performances was undertaken. The etude means and standard deviations for the twenty students who scored highest and the twenty students who scored lowest on the *Total* test of the *Advanced Measures of Music Audiation* were compared. The highest scores ranged from 72 to 78 (the 88th percentile and above on national norms). The lowest scores ranged from 45 to 55 (the 40th percentile and below on national norms). The data are presented in Table 9 along with the etude means and standard deviations for all 114 students who participated in the study. Since the highest possible score is 15 for each dimension and 45 for all dimensions combined, the magnitude of the high and low rating scale means is indicative of the discriminative predictive power of the *Advanced Measures of Music Audiation*. The difference of 9.3 points between the means for the high scoring and low scoring groups for Dimension 1, 8.9 points for Dimension 2, 8.3 points for Dimension

3, and 26.4 points for all dimensions combined, corroborate the fact the students who score high on the *Advanced Measures of Music Audiation* demonstrate significantly better performance standards than do students who score low on the *Advanced Measures of Music Audiation*.

Table 9

MEANS AND STANDARD DEVIATIONS OF THE COMBINED JUDGES' RATINGS OF THE ETUDE PERFORMANCES OF THE TWENTY HIGHEST AND THE TWENTY LOWEST SCORING STUDENTS ON THE TOTAL SCORE OF THE ADVANCED MEASURES OF MUSIC AUDIATION

	Highest Group		Total Group		Lowest Group	
	Mean	SD	Mean	SD	Mean	SD
Dimension 1	14.5	2.08	9.8	4.12	5.2	1.81
Dimension 2	13.9	1.42	9.5	3.96	5.0	1.46
Dimension 3	12.5	1.87	8.2	3.40	4.3	1.45
All Dimensions Combined	40.9	2.81	27.5	10.83	14.5	3.81

A curious, perhaps insignificant, finding had to do with the comparative intercorrelations for the high scoring and low scoring students on the *Advanced Measures of Music Audiation*. The intercorrelations between the *Tonal* and *Rhythm* tests was .32 for the high scoring group and -.59 for the low scoring group. That both are lower than that for the total group of students (.73) is to be expected. What is difficult to explain is why the intercorrelation is positive for the high scoring group and negative for the low scoring group. Whatever the reason or reasons, it is conceivable that the observed phenomenon is in some way responsible for attenuating the diagnostic power of the *Advanced Measures of Music Audiation*.

Conclusions

The *Advanced Measures of Music Audiation* may be used with confidence to predict the music performance achievement of undergraduate and graduate college and university music majors. Administrators and professors may use the information that such prediction provides for a variety of purposes. Those purposes, in conjunction with levels of appropriate *Advanced Measures of Music Audiation* scores, are best determined in accordance with the educational philosophy associated with each school.

Appendix A

PIANO

Cantabile

Piano score for Appendix A, consisting of two systems of music. The first system is in 2/4 time with a key signature of one flat (B-flat major). The second system is in 3/4 time with a key signature of one sharp (F# major). The music is written for piano and includes various melodic and harmonic lines.

TENOR VOICE at the octave, SOPRANO VOICE, VIOLIN, TRUMPET in C

Cantabile

Vocal and instrumental score for Appendix A, consisting of two systems of music. The first system is in 2/4 time with a key signature of one sharp (F# major). The second system is in 3/4 time with a key signature of one sharp (F# major). The music is written for tenor voice at the octave, soprano voice, violin, and trumpet in C.

ALTO VOICE

Cantabile

Alto voice score for Appendix A, consisting of two systems of music. The first system is in 2/4 time with a key signature of three sharps (F# major). The second system is in 3/4 time with a key signature of three sharps (F# major). The music is written for alto voice.

BASS VOICE, STRING BASS
Cantabile

Two staves of musical notation for Bass Voice and String Bass. The first staff begins with a treble clef, a key signature of one sharp (F#), and a time signature of 2/4. The melody consists of quarter and eighth notes, with a slur over a group of eighth notes in the second measure. The second staff continues the melody, ending with a double bar line.

VIOLA
Cantabile

Two staves of musical notation for Viola. The first staff begins with a C-clef (viola clef), a key signature of one sharp (F#), and a time signature of 2/4. The melody consists of quarter and eighth notes, with a slur over a group of eighth notes in the second measure. The second staff continues the melody, ending with a double bar line.

BASSOON, CELLO, TROMBONE
Cantabile

Two staves of musical notation for Bassoon, Cello, and Trombone. The first staff begins with a bass clef, a key signature of one flat (Bb), and a time signature of 2/4. The melody consists of quarter and eighth notes, with a slur over a group of eighth notes in the second measure. The second staff continues the melody, ending with a double bar line.

FLUTE, PICCOLO, OBOE, CLARINET in Eb and Bb

Cantabile

**BARITONE SAXOPHONE in Eb, ALTO CLARINET in Eb,
BASS CLARINET in Bb, HORN in F, SOPRANO SAXOPHONE in Bb
ALTO SAXOPHONE in Eb, TENOR SAXOPHONE in Bb**

Cantabile

TUBA

Cantabile

Appendix B

RATING SCALE FOR ALL VOICES AND INSTRUMENTS EXCEPT PIANO

Dimension 1 - Tonal

Circle a number

5. Implied modulations, both tonality and keyality, are obvious.
4. Chromatics are relatively in tune.
3. Tonic, dominant, and subdominant functions are in tune.
2. Tonic and dominant functions are in tune.
1. Keyality and tonality are established.

Dimension 2 - Rhythm

Circle a number

5. Elongations are accurate.
4. Divisions are accurate.
3. Tempo is consistent throughout.
2. Meter is established and maintained.
1. Tempo is initially consistent.

Dimension 3 - Expression

Check from none to all

- ___ Style is established and maintained.
- ___ Modulations are supported rhythmically.
- ___ Phrasing is musical.
- ___ Dynamics are musical.
- ___ Tempo changes are musical.

RATING SCALE FOR PIANO

Dimension 1 - Instrumental Technique

Check from none to all

- Hands are synchronized and all notes speak.
- Hands are synchronized with pedal.
- Melody and harmony are balanced.
- Tone quality is characteristic of the instrument.
- Transition among registers is continuous.

Dimension 2 - Rhythm

Circle a number

5. Elongations are accurate.
4. Divisions are accurate.
3. Tempo is consistent throughout.
2. Meter is established and maintained.
1. Tempo is initially consistent.

Dimension 3 - Expression

Check from none to all

- Style is established and maintained.
- Modulations are supported rhythmically.
- Phrasing is musical.
- Dynamics are musical.
- Tempo changes are musical.

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