

SUMMER 1988

EVALUATION AND MUSICAL APTITUDE NEWSLETTER

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ME SRIG MEMBERS

We feel special in having enough material for two newsletters. The material in this newsletter was ready for our pre-Indianapolis meeting but we felt that the newsletter was already too long and "saved these goodies" for an extra summer issue. We have also been asked to duplicate the material from the MENC sessions for those members unable to attend and we will be doing so in the early fall.

Evaluation continues to be a primary topic and a problem faced by music educators at all levels. I hope that each of us can be available to music educators in our own locale to offer what ever advice and assistance is needed.

The National Arts Education Research Center will host a conference entitled Arts Education in Transition: Developing a National Perspective on Standards and Assessment Practices in the Arts on the Urbana campus October 11-14. If you would like to attend, please write to Ted Zernich at NAERC, 606 So. Gregory, Urbana, Illinois, 61801.

A few of the speakers will be Francis Hodsoll, Chairman, National Endowment for the Arts; Ernest Boyer, Carnegie Foundation; Phillip Jackson, University of Chicago; Diderick Shoenau, Ministry of Education, The Netherlands; Rachid Rkaina, Secondary Examinations Council, Great Britain; Michael Priestly, National Evaluation Systems; Paul Lehman, University of Michigan; Spence Swinton, Educational Testing Service and individuals involved in atatewide testing programs in several of our states.

If you know of other MENC members who are interested in evaluation, have them send us their name and address so we can add them to our growing mailing list.

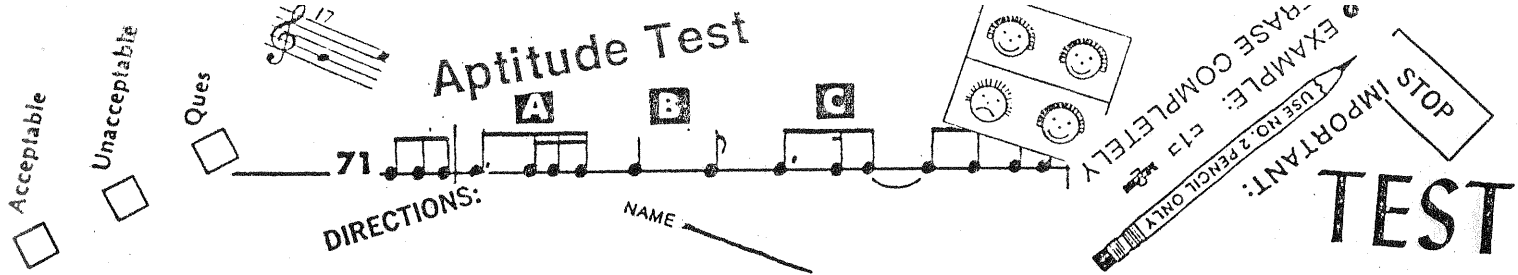
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Regional Leaders for the Measurement and Evaluation SRIG:

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Charles Chapman (Southwestern)	Harry Mamlin (Midwestern)



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Call for Newsletter Contributions

Your contributions to the newsletter are most welcome! There are no restrictions regarding the content as long as it is of interest for the SRIG. Please send us news of research completed, research in progress, reviews of journal articles or books of interest, sources of special reports, requests for information about or assistance with research questions, general comments and ideas or any announcements which might be of interest to the members of the SRIG. The next issue will be published in the fall.

"Music and Technology" Call for Papers

Researchers are invited to submit excellent research papers for consideration of presentation at the national convention for "Music and Technology" in Nashville, March 16-18, 1989. The convention, a national in-service convention of Music Educators National Conference, is being sponsored by the Southern Division of the MENC. All individuals are encouraged to submit research reports, including those who have systematically investigated the use of technology in music settings or have used technology to investigate music behavior. Submissions will be reviewed by a panel of qualified judges and applicants will be notified by January 15, 1989.

Individuals whose reports are chosen for presentation will prepare a poster describing their research and be available during the poster presentation session to discuss their work with interested music educators. The poster presentation format allows those in attendance to freely mingle with the presenters and discuss the projects of greatest interest to them. In addition to this poster session, there will be a main that will focus on technology in music research.

Presenters will also furnish 150 copies of an abstract describing their research and 12 copies of the complete research report, two of which will go into the MENC archives. Presenters may also be asked to respond to post-convention inquiries about their work, including requests for full copies of their report.

Those who wish to submit a report for consideration should comply with the following guidelines and the Code of Ethics published in the Journal of Research in Music Education.

1. Submit 4 copies of a full report, including a maximum of a 150-word abstract, describing their project. The author's name and institutional affiliation should appear on a separate cover page of each report. These will not be returned
2. Each submission should include a self-addressed, stamped legal-sized envelope and a self-addressed, stamped postcard.
3. Send submissions to Henry E. Price, School of Music, University of Alabama, Tuscaloosa, AL 35487-2876.
4. Submissions must be received by December 1, 1988 for consideration.

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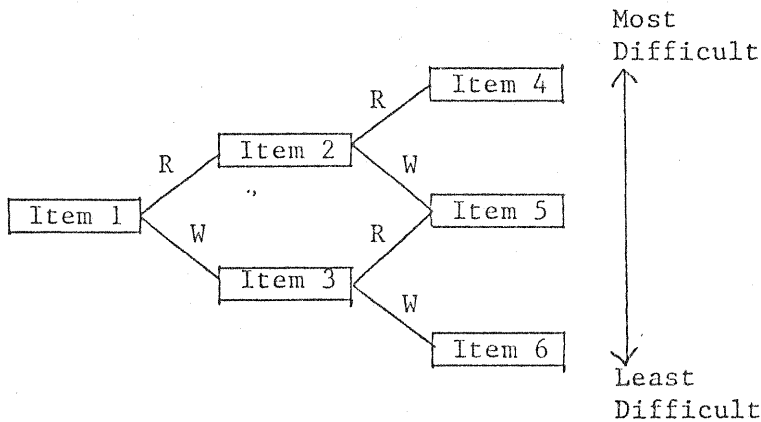
ADAPTIVE TESTING

Michael Venn, University of Illinois at Urbana-Champaign

Adaptive testing is the process of tailoring the difficulty of test questions, based on answers to previous items, to the ability level of the individual taking the test. Although the first adaptive tests often used self-scoring techniques (fast but often unreliable) or a one-to-one relationship between examiner and examinee (very time consuming, adaptive testing has become truly feasible through the increase in power, and decrease in cost of the computer. With computers the scoring is immediate and the complex mathematical calculations of Item Response Theory, an integral part of item selection, can be done in a fraction of a second.

In order for adaptive testing to work, a large pool of items of known difficulty and discriminative ability is necessary. There are two basic ways of choosing the initial item. One method is the presentation of a moderately difficult item. A correct response would elicit an item of greater difficulty while an incorrect response produces a less difficult question. In the second method the initial item is chosen based on some prior knowledge of the individual. This knowledge could be in the form of educational background, previous test scores, or the administration of a short pretest. Again, from the initial question a correct response will branch the examinee to more difficult questions while an incorrect response will send the examinee to less difficult questions.

In the simplest form the following item selection would occur: A correct response to Item 1 would branch the examinee to the more difficult Item 2. a second correct response would elicit an even more difficult Item 4 while an incorrect response on Item 2 would take the examinee to the less difficult Item 5. An incorrect response to Item 1 would produce Item 3 from which a second incorrect response would branch to Item 6 while a correct response would take the examinee to Item 5. A short illustration may help to clarify.



R = Correct Response
W = Incorrect Response

(taken from table 7.1.1, page 216 of ITEM RESPONSE THEORY: Application to Psychological Measurement. Charles L. Hulin, Fritz Drasgow, Charles K. Parsons. Homewood, IL: Dow Jones-Irwin, 1983.)

In more complicated applications computers are able to choose future items based on current ability estimates and prediction of maximum item discriminative power.

There are several different methods of selecting future items. Determining which one to use is critical to the success of the adaptive test. Factors to take into account include probability of guessing the correct answer, obviously greatest for a true-false test, and the possibility of cheating. The latter can become a factor when the maximum information item selection method is followed resulting in heavy usage of a small number of items with maximum discriminative abilities. It becomes necessary to balance measurement accuracy with degree of control.

An adaptive test is terminated in one of two ways, the completion of a set number of items or the meeting of a particular criteria. While the first method is more useful when comparing to a conventional test, it does not fully exploit the capabilities of an adaptive test. In the second method an examiner may choose, for instance, to terminate the test when a reliability of a .90 is reached. This could possibly result in a test length of six items for one examinee while another necessitates eleven items to reach a .90 reliability. Here the ability of the adaptive test to only administer items of appropriate difficulty is put to use.

The benefits of adaptive tests over conventional test include: greater reliability and validity with fewer questions, thus increasing efficiency along with decreasing the possibility of test fatigue; greater measurement accuracy over a broader range of abilities; and immediate scoring.

Adaptive tests are just beginning to find musical applications. In constructing a tonal memory test Walter Vispoel (1987) was able to achieve .90 reliability with an average of 11.6 items and as few as 6. This is in contrast to the somewhat less reliable thirty item tonal measures of Seashore and Wing.

And while the above findings seem intriguing enough, adaptive testing also has applications for diagnostic testing and computer managed instruction. The promise of adaptive testing certainly warrants our attention as a means of building on and improving the successes of the past.

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- Hulin, Charles L., Drasgow, Fritz & Parsons, Charles K. ITEM RESPONSE THEORY: Application to Psychological Measurement (Chapter 7, "Adaptive Testing", 210-232). Homewood, IL: Dow Jones-Irwin, 1983.
- Vispoel, Walter P. An Adaptive Test of Musical Memory: An Application of Item Response Theory to the Assessment of Musical Ability. (Doctoral Dissertation, University of Illinois, 1987).
- Ward, William C. "Using Microcomputers to Administer Tests". Educational Measurement: Issues and Practices; v3 n2, Summer 1984; 16-20.

CHARACTERISTICS OF MOTIVATION FOR MUSIC AND
MUSICAL APTITUDE OF UNDERGRADUATE NON-MUSIC MAJORS

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Abstract

While musical aptitude and motivation for music have long been recognized by music educators as important factors in the learning process, only the role of musical aptitude has been examined in the majority of studies done to date. The findings reported in these studies indicate that while musical aptitude is a factor, it accounts for only part of the variation in music achievement.

The purpose of this study was to investigate the contribution to music achievement of motivation for music as well as musical aptitude. The research questions specifically addressed were (a) do differences exist in motivation and aptitude of undergraduate non-majors due to grade level or gender, (b) what relationship exists between motivation for music and musical aptitude, and (c) what is the pattern of relationships between qualitative and quantitative measures of motivation for non-music majors?

The measure of musical aptitude used in the study was the experimental college version of the *Musical Aptitude Profile* developed by Schleuter (1978). Two of the three tests which comprise the profile were found to be unreliable and were eliminated from the study. The third test, *Musical Sensitivity*, was moderately reliable ($\alpha = .65$) and it was used in the investigation as a measure of musical aptitude. A marginal statistical difference ($p < .051$) was found due to grade level on the motivation variables and the third aptitude measure. However, it follows that because of the low reliability of the instrument, it should not be used as a measure of musical aptitude. The measures of the qualitative and quantitative aspects of motivation, on the other hand, proved reliable. In addition, the two types of variables appear to measure unique aspects of motivation for music. Thus, these motivation measures could be of use to instructors in non-music major courses to determine what motivates their students for musical involvement and the degree of their motivation.

Contrary to the findings in studies involving pre-college students, neither grade level nor gender effects were found. It appears that by the time students are in college, the reasons they cite for success and failure in music have stabilized. Interestingly, college non-music majors place greater emphasis on affect for music as the major cause for musical success whereas 12th graders emphasize effort and ability.

Note: Copies of the complete paper are available from the authors.

PREDICTORS OF FRESHMAN THEORY GRADES

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Since the objective of basic musicianship or music theory courses is to improve musical abilities, the factors which affect the development of these abilities need to be identified. Further, we must measure to what extent those factors affect musical learning. The findings of studies done to date are inconclusive. Some investigators have found measures of musical aptitude to be significant predictors of music achievement. However, the findings in a number of studies indicate that measures of nonmusical factors (such as general intelligence and academic ability) are more significant predictors of success in music than is musical aptitude.

The main purpose of this portion of the study was to investigate the relationships of selected factors to achievement in freshman music theory as indicated by the first semester course grade (N=121). The factors selected for study include: (a) general ability, as indicated by scores on the verbal and math components of the *Scholastic Aptitude Test (SAT)*, (b) academic achievement, as reflected by high school grade point average, (c) musical aptitude, as indicated by scores on the *Tonal Imagery* and *Rhythm Imagery* tests of the experimental college version of the *Musical Aptitude Profile (CMAP)* (Schleuter, 1978), (d) pre-college musical experience, including private study and ensemble experience, (e) principal instrument, and (f) sex. Answers to the following two questions were sought:

1. What combination of predictors best predict grades in the first semester of music theory coursework?
2. Can the patterns of intercorrelations among variables (excluding the variable indicating sex) be summarized by several components that represent academic ability, musical aptitude, and experience in music?

While a number of predictors correlated significantly with the criterion measure, first semester music theory grades, the best predictors were: *SAT* math component, high school grade point average, the incidence of piano experience, and *SAT* verbal component ($R^2=.41$, $p<.001$). No differences were found due to sex, principal instrument or years of performing experience. Although the *Tonal Imagery* test (coefficient alpha = .81) of the *CMAP* correlated significantly with music theory grades ($p<.05$), neither it nor the *Rhythm Imagery* test (coefficient alpha = .67) added to the prediction of theory grades when the four best predictors were in the equation. Thus, it appears that the best indicators of success in the first semester of music theory are academic ability and achievement, and piano experience. Knowledge of students' performance in these areas could be of use to instructors of freshman music theory courses to identify students who might benefit from tutorial assistance.

To further explore the above questions, principal components analysis was carried out. Five components were produced: (a) academic and music ability, (b) piano experience, (c) years of performing experience, (d) performance on more than one instrument, and (e) musical aptitude. The five components accounted for 75.6% of the variance in the original variables. Although three of the five components summarize music experience, each of the three provides unique information. Interestingly, the music theory grade criterion measure loaded on the same component as the academic ability measures while the two measures of musical aptitude loaded on a

separate component. The results of this analysis provide further evidence that the relationships between measures of academic ability and achievement in music theory coursework are stronger than those between the measures of musical aptitude and music achievement.

A paper relating further details of this study will be forthcoming.