INFORMATION TO USERS

74-13,937

MELTON, Ellis Eugene, Jr., 1943-
  A STUDY OF DIFFERENCES AMONG VARIOUS GROUPS
  OF MICHIGAN STATE UNIVERSITY MUSIC STUDENTS.

  Michigan State University, Ph.D., 1973
  Music

A STUDY OF DIFFERENCES AMONG VARIOUS GROUPS

OF MICHIGAN STATE UNIVERSITY

MUSIC STUDENTS

By

Ellis E. Melton

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Music

1973

ABSTRACT

A STUDY OF DIFFERENCES AMONG VARIOUS GROUPS
OF MICHIGAN STATE UNIVERSITY
MUSIC STUDENTS

By

Ellis E. Melton

The purpose of this study was to discover whether
certain variables differentiate among groups of college
music majors. Of particular interest was whether any of
the measures could be used in the selection process for
sophomore music students entering the music education
curriculum. Thirty-one variables were selected which of-
fered some promise of usefulness. These variables in-
cluded 3 scales of the Aliferis Music Achievement Test,
1 rhythmic score from the Drake Musical Aptitude Tests,
the 15 scales of the Edwards Personal Preference Schedule
(EPPS), and 2 scales from the SAT (SAT-V and SAT-Q). The
last ten variables were grade point averages (GPA's) in
both music courses and general college courses.

Over 500 music majors at Michigan State University
were involved in the study, either by their taking various
tests or contributing GPA's. The students were divided into
groups on the basis of six independent variables: class,

curriculum, sex, enrollment status, transfer status, and major instrument. Enrollment status was determined by the students presence or absence in the music department 18 months after the study began.

All of the information about the students was prepared for data analysis by computer. Appropriate statistical analyses were made.

Certain conclusions were drawn based on the findings of this study:

1. Music students who leave the music department for any reason except graduation do not score differently on the Drake, Aliferis, EPPS, or SAT.

2. The only variable which differentiates students according to the music curriculum in which they are enrolled is SAT-V. None of the other thirty-one variables result in statistically significant differences.

3. Five variables differentiate between sexes. Males score significantly higher on Deference, Heterosexuality, and SAT-Q, while females score significantly higher on Aliferis Melodic and Endurance.

4. Two variables show significant differences among students grouped by major instrument: Harmony GPA and Advanced Harmony GPA.

5. There are no differences among students according to the class (Freshman, Sophomore, and Junior) on any of the thirty-one variables used in this study.

6. Transfer students do not differ from native students on any of the nineteen test scores.

7. Michigan State University music students differ significantly from published college norms on ten of the fifteen variables of the EPPS. The significance is due largely to sample size, however, and the actual differences may not be considered meaningful.

A correlation matrix of the thirty-one variables revealed certain interesting correlations:

1. Applied music grades had very low correlations with other GPA's and test scores. Apparently, grades in applied music are fairly independent.

2. Among the EPPS scores, four consistently correlated highly with GPA's: Achievement had high positive correlations, and Affiliation, Abasement, and Nurturance had high negative correlations.

3. Aural Harmony GPA's had a strong positive relationship with SAT-V and academic GPA's, but a low (-.05) relationship with applied music.

Although some significant differences were found, the actual differences among groups of music majors were not considered meaningful as a basis for music department selection procedures. Future researchers would be well advised to look at fewer paper-and-pencil tests and more strongly at structured interviews. Student behavior in actual musical situations (for instance, conducting class or some early student teaching situations) also warrants monitoring.

To Kay

ACKNOWLEDGMENTS

The author is grateful and deeply indebted to:

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

THE PROBLEM

Introduction

People who practice a particular profession must
possess certain skills, information, and attributes which
are not as concentrated throughout the general population.
These individual attributes are not shared exclusively by a
particular profession, but such a unique combination of at-
tributes can define a profession. Some of these character-
istics, particularly highly complex cognitive skills, are
acquired through formal schooling. Some others, including
advanced motor skills, are often acquired through individual
practice and life experiences. A third category of character-
istics of professionals includes those which are often called
aptitudes--that is, those held by individuals before advanced
training. These include psychological needs, physical char-
acteristics and inborn inclinations.

A definition of "profession" includes the statement:
"an occupation or vocation requiring training in the liberal
arts of the sciences and advanced study in a specialized
field."[1] Training in the liberal arts and sciences includes

---

[1]The American Heritage Dictionary of the English
Language. (New York: Houghton Mifflin Company, 1971).

by tradition a common body of knowledge generally recommended for all educated citizens. It is in the "advanced study" portion of a professional's education that the basic skills, information, and attributes are acquired. A university provides both types of education for the professional.

The fact that some individuals are better suited than others for a particular profession is well demonstrated by simply observing that some succeed while others fail. The failure of individuals can be observed at many points before and during a career. Dropping out of school, failing to find a professional position, or changing professions late in life might indicate that the choice of career was a poor one. On the other hand, a person who exhibits none of the above behavior is not necessarily successful. If he is actually practicing his chosen profession he is at least demonstrating that he possesses some of the traits which set him apart from the general population. Even a poor scientist knows much about science, just as a not-too-successful professional athlete is probably better developed physically than the non-athletic person.

Naturally, the ability to assist people with career decisions is important to counselors, so important that much research has been directed to that end. In spite of the obvious differences in job descriptions among professions, no one has achieved a high degree of accuracy in predicting the

most suitable occupation for a particular individual. This
is especially true in the early stages of training, referred
to above as the "liberal arts and sciences" portion of general
education.

Another part of the problem of prediction lies in dis-
covering which traits are really unique or at least highly
developed among successful people in any occupational group.
For instance, one might assume that all successful lawyers
possess a basic knowledge of law, as well as oratorical tal-
ents. In fact, the common bond might be simply perseverance
or verbal reasoning ability. Or perhaps the term "lawyer" is
too heterogeneous and there are only common traits between
"trial lawyers" or "trial lawyers from Harvard." Thus, the
definition of "successful professionals" and the discovery of
unique traits held in common by these successful professionals
seem to be two primary problems in prognosis of professional
success.

Who is charged with the responsibility of screening
people for various professions? The precedent for selection
by colleges seems clearly established:

> "Colleges and universities are the primary institu-
> tions in our society that affect and direct the flow of
> students into the professional occupations. Colleges
> not only provide an education for the professions and
> the specialized occupations, they also serve a critical
> function in channeling students into careers and in

eliminating students who seem to lack the prerequisites for entry to a profession.[2]

In liberal arts and humanities, colleges have never promised graduates that they would be qualified for any particular occupation. These fields have traditionally concentrated on developing a "well rounded" adult who can then adapt himself to a number of occupations with the basic tools he has acquired. Professional schools, on the other hand, are established as training grounds for particular occupations and have a responsibility to graduate only those who have acquired entry skills for those occupations.

Assuming that teaching is a profession according to the definition stated earlier, there is the possibility that teachers differ from the general population in one or more variables. Since the term "teacher" encompasses high school, college, elementary and private teachers in widely varied fields, it is not surprising that research has not been conclusive when defining "teaching characteristics." Perhaps a chemistry teacher holds more in common with laboratory scientists than with teachers in other disciplines. Or perhaps college teaching requires a different set of traits than those needed for kindergarten teaching, the two groups having little in common to distinguish them from the general population. Isolating and measuring a homogeneous group of teachers appears to be a prerequisite for definitive research in the prognosis of teaching success.

---

[2]John K. Folgen, Helen S. Astin, and Alan E. Bayer, <u>Human Resources and Higher Education</u> (New York: Russell Sage Foundation, 1970), p. 13.

This study will deal with music teachers in the public schools as they enter the university preparation portion of their careers. This is usually the earliest point at which these teachers make a commitment to their chosen field, and therefore a critical point in their lives.

Need for the Study

Universities are constantly faced with the task of evaluating students for various purposes. Such routine matters as college admissions, grades, course requirements and graduation criteria all require the institution to make a judgement about the student on the basis of a variety of collected data. Many times these data consist of some easily obtainable but statistically questionable scraps of information such as test scores or previous course grades. All too often major decisions are based on date of application, as is sometimes the case in college admission procedures. This method of selecting college students may be expedient and even democratic, but it is not justified in terms of the best use of human potential.

One particular area which needs precise evaluation is in the selection of prospective students for teacher education programs. Typically, the student makes application after his first, second or third year of college and the responsibility for the screening rests with either the

professional education faculty or a committee from the subject-

matter field. Drayer summarizes the usual procedure:

> "Some objective evidence for evaluating the applica-
> tion is immediately available. At the time he applies
> for the program, the candidate may be required to present
> a doctor's certificate . . . his past academic record . . .
> (and) the student has a personal interview, during which
> a general impression of his motivation, personality, and
> expression may be formed. After his application, and
> before his admission to the program, further information
> may be gathered from faculty members. If all the factors
> appear to be favorable, the applicant is admitted to the
> program."[3]

Drayer continues to state that the candidate is

watched as he moves through the teacher education program

and is sometimes dropped for academic or other reasons. For

many years the net result of this rather loose procedure was

that just about anyone who passed prescribed courses with a

sufficient grade was graduated and allowed to enter the teach-

ing profession.

In 1964 Farr studied the tests which were being used

in the process of screening future teachers in institutions

which belonged to the American Association of Colleges of

Teacher Education. Of 443 schools which responded, he found

445 distinct test titles.[4] Obviously, a valid test has not

---

[3]Adam M. Drayer, The Teacher in a Democratic Society
(Columbus, Ohio: Charles E. Merrill Publishing Company, 1970),
p. 247.

[4]David Farr, "Evaluation and Selection Instruments in
Teacher Education Problems," summary report of the Subcommittee
on Testing in Teacher Education Committee on Studies, American
Association of Colleges for Teacher Education, 1964, p. 3,
cited by Drayer, 249.

been found, for if it existed, most institutions would adopt
it.

At the present time there is a particular need for
research concerning procedures of evaluating music education
students at Michigan State University. Because of the rapid
growth in the enrollment of the College of Education and
the declining job market for teachers, a quota system was
established in the Spring term of 1971 whereby only a specific
number of juniors would be allowed to enter the College of
Education from each subject-matter field. In the case of the
music department, approximately 40 of 130 sophomore music edu-
cation majors would not be allowed to continue in that curricu-
lum. In effect, students were to be screened and selected
for the teaching profession at the end of the sophomore year.
It was possible, of course, for a student to transfer to
another institution and complete the music education degree.

A reliable screening device is needed not only when
a student makes official application to enter the teacher
training curriculum, but at other points in his academic
career. Many music majors arrive on campus with no idea of
the standards and demands of a music department and eventually
become dropouts. They have wasted the time and resources of
the institution as well as their own. A testing and counsel-
ing program immediately preceding a student's first enrollment
would alert the student to any weaknesses in his background

so that he might develop other options for himself. In the hands of a skilled counselor, an ego-shattering confrontation with the facts of one's limitations can be turned into a positive rather than a negative experience. The counselor needs facts and statistics to make counseling sessions valid.

What information does the college counselor need? There are basically three types: details of the curricula available; information about the individual student; and the ways a given student is likely to react to a curriculum. The first of these is rather easy for the counselor to acquire, as the curriculum is obvious and fairly constant. The information concerning the individual student is also easy to acquire if the exact kinds of information needed are shown. The last of these--the way particular students will achieve in a curriculum and ultimately in a profession--is more complex than the first two and requires more than casual observation to obtain.

Purpose

The purpose of this study is to investigate certain measurement tools to determine their usefulness in the selection of music education majors. This purpose is pursued by means of an extensive description of the music students enrolled during one term, using a number of variables. If these variables do not in any way discriminate among specific sub-groups

of the music student population, particularly between music education and non-music education students, it would seem that the administration should look at other variables. If at least one variable does indeed discriminate in some way, a long term longitudinal study would be in order to determine if it is also a predictor of success in teaching.

Research literature indicates that the ultimate screening tool will not be a simple univariable test. For example, J. P. Guilford hypothesized that any attempt to measure general intelligence and arrive at a single score, such as an "IQ," would be futile. He and his followers have proposed a three-dimensional model which includes 120 cubicles, each of which supposedly can be defined and measured.[5] If intelligence is this complex, and native intelligence is one facet of success in a profession, it follows that the predictor of success will not be a simple one-dimensional attribute.

It can be hypothesized that the traits necessary to become a successful music teacher, or even remain in college as a music student, form a complex pattern of interrelated characteristics. One might suspect, for instance, that some combination of perseverance, intelligence, training, personality, physical characteristics and background affect college success and that slightly different combinations of these

---

[5]J. P. Guilford, The Nature of Human Intelligence (New York: McGraw Hill Book Company, 1967).

characteristics would be found in the various disciplines.
If this is true, simple SAT scores or IQ test scores would not
seem inclusive enough. Perhaps a multivariate approach is
more applicable, whereby a number of variables contribute to
make up a profile of each student. The problem is: what are
the appropriate variables for the profile?

The purpose of this study is not an exhaustive search
for one specific, foolproof variable which will predict a
student's potential as a music teacher. This type of finding
appears impossible as long as humans have individual differ-
ences and educational measurements remains an inexact proced-
ure. One immediate possible outcome, however, is the elimina-
tion of consideration of variables which seem to have no
bearing at all on the music students.

The particular need for a study using more than one
or two variables will be evident when the literature is re-
viewed in Chapter II. Many researchers have dealt with a
small number of subjects who were measured on a few variables,
whereas this study will approach the problem on a broader
scale. In addition, this study is useful as a reassessment
of the one-variable types of research, and will either help
reinforce or refute those findings.

The variables chosen for the study include two types.
The first type are written tests:

1. SAT Verbal
2. SAT Quantative
3. Aliferis Musical Achievement (Melodic)
4. Aliferis Musical Achievement (Rhythmic)
5. Aliferis Musical Achievement (Harmonic)
6. Drake Musical Aptitude (Rhythmic)
7. Edwards Personal Preference Schedule (Fifteen scores)

The second category of data includes various grades for specific courses and grade point averages as follows:

1. Freshman University College grade average
2. Sophomore University College grade average
3. Basic Harmony grade average
4. Advanced Harmony grade average
5. Aural Harmony grade average
6. Advanced Aural Harmony grade average
7. Freshman applied music grade average
8. Sophomore applied music grade average
9. Freshman cumulative grade average
10. Sophomore cumulative grade average.

Hypotheses

The hypotheses for this study are:

Hypothesis 1: Music students who leave the music department for any reason except graduation will differ on one or more variables from those who remain.

Hypothesis 2: Music students differ on one or more variables when grouped according to the specific music curriculum in which they are enrolled.

Hypothesis 3: Music students differ on one or more variables when they are grouped according to sex.

Hypothesis 4: Music students differ on one or more variables when they are grouped according to their major instrument.

Hypothesis 5: There will be no difference among music students on the Aliferis, Drake, or EPPS when the students are grouped by class.

Hypothesis 6: Music students who transferred to Michigan State University from other institutions do not differ from students who began at the University as Freshmen on standardized aptitude and achievement tests.

Hypothesis 7: Music students do not differ from the general population of college students on any of the personality variables measured by the Edwards Personal Preference Schedule.

Definitions

Freshman

At Michigan State University, a freshman is any student who has earned less than forty term credits.

Sophomore

At Michigan State University, a sophomore is any student who has earned forty to eighty-four term credits.

Junior

At Michigan State University, a junior is any student who has earned eighty-five to one hundred twenty-nine term credits.

Music Education Students

Music education students are any undergraduate students who have declared themselves in the curriculum leading to certification as school music teachers, and who have been so designated in official university records.

SAT

SAT is the Scholastic Aptitude Test.[6]

GPA

GPA is the Grade Point Average as computed on a 4.0 scale, where 4.0 is equivalent of a grade of "A."

University College
Courses

University College Courses are those basic courses required by the University for any Baccalaureate degree.

Cumulative G.P.A.

Cumulative G.P.A. is the grade point average on all courses taken at the University to date. For instance, a Junior would have acquired both a Freshman and Sophomore cumulative G.P.A.

Transfer Student

A transfer student is any student who begins his college work in another institution or another department at Michigan State University before entering the music department.

Scope and Limitations

The study was undertaken at Michigan State University on the campus in East Lansing. The data concering course grades, major instrument, transfer status, and curriculum were

---

[6]Scholastic Aptitude Tests (Princeton, New Jersey: College Entrance Examination Board, 1961).

gathered by the researcher directly from the student records as maintained by the music department. All testing and data gathering was done between November 1, 1971, and April 30, 1972, among students who were classified as music majors as of November 1, 1971.

Although the study concerns students at one University at one point in time, the Cornfield-Tukey[7] argument allows others to generalize the results of this or any study if they believe that the conditions are similar to their own. For instance, a music department at a large state university in another state might decide that the students involved in this study in 1971-1972 are enough like theirs in 1975 that the results would be applicable. For this reason, the population and conditions will be carefully described in Chapter III.

This is not a true experimental study which offers several treatments of different samples in the hope that the results may be inferred to larger populations. Many assumptions are necessary for that type of study, not the least of which is either randomization or random selection. The students about whom data were gathered were not randomly selected in any sense. In some cases, by refusing to attend the testing sessions, students chose not to be a part of the study. Since most of the testing took place in classes, some students were excluded.

---

[7]J. Cornfield and J. W. Tukey, "Average Values of Mean Squares in Factorials," Annals of Mathematical Statistics XXVII, pp. 907-949.

The data will be handled through a variety of statistical processes including correlation, multivariate analysis of variance, and "t" tests. Means and variances will be computed and reported as descriptive data.

Overview of the Thesis

In the following chapter, literature related to this study will be discussed. Some of the related literature dealing with the uses of the individual variables will be reviewed, but the chapter will deal primarily with the problem of selection in music schools.

In Chapter III the design of the study is discussed, along with the independent and dependent variables. The results of the study are presented in Chapter IV. The final summary and conclusions will be submitted in Chapter V, along with suggestions for further research.

CHAPTER II

SURVEY OF THE RELATED LITERATURE

Three areas of review seem pertinent to this investigation: the prognosis of success in teaching, the prognosis of success in music teaching, and other more directly related studies with music majors using a number of variables.

The Prognosis of Success in Teaching

Research on predicting teaching success can be found dating from 1905, with the largest bulk of the literature in the 1930's. Generally, the studies before 1950 were not very well done by modern standards, and the results were contradictory. Advanced quantitative measurement techniques were not available before the computer age, and the research designs tended to be faulty, causing the findings to be suspect.

Beginning around 1950 the problem of prognosis of teaching success was attacked in earnest. One of the first conclusions was that there would be no easy answer. For instance, IQ measures enjoyed wide popularity during the decade of the 1950's, but they turned out to be poor predictors. One viewpoint follows:

It seems highly unlikely that future researchers using global measures of intelligence and conventional

16

criteria of teaching success will tell us much more than we now know . . .[1]

In fact, approximately 30% of the studies between 1927 and 1952 found negative correlations between IQ and teaching success. As Guilford pointed out with his structure of the intellect model, human intelligence is far too complicated to summarize with a single number.

Another well researched area of the problem is the use of a personality profile as a predictor. Some very pedestrian findings have resulted, such as: good teachers are more kind, cheerful, and courteous than are poor teachers. This type of information is not useful because it is not stated quantitatively. Projective techniques, such as the Rorschach Ink Blot Test and the Thematic Apperception Test (TAT) showed much promise twenty years ago but have failed to distinguish effectively good teachers from bad ones. These tests are difficult to score and interpret and are therefore impractical for many uses.

A number of fairly recent investigations have pertained to the prediction of general teaching success. Bach[2] found negligible correlations between student teaching grades

---

[1] J. W. Getzels and P. W. Jackson, "The Teacher's Personality and Characteristics," Handbook of Research on Teaching, ed. N. L. Gage (Chicago: Rand McNally and Co., 1965), p. 572.

[2] Jacob O. Bach, "Practice Teaching Success in Relation to Other Measures of Teaching Ability," Journal of Experimantal Education, XII (1952), 57-80.

and success in the field. Ringness[3] found certain attitudes predictive of teaching success, particularly interest in a subject matter field. Charles[4] reported the use of projective techniques in the selection of teachers.

A great many psychological, intelligence and aptitude tests have been used to try to predict success in teaching. The primary problem seems to be that teachers are more closely allied with their subject matter fields than they are to other teachers in different fields. For instance, a music teacher may have more in common with a professional conductor than with a chemistry teacher. Therefore, any instrument which purports to measure a trait or produce a profile of "teachers" faces the problems of a heterogeneous population.

It is for the above reason that the related literature reviewed herein deals primarily with music oriented studies. The fact that successful music teachers appear to be a much more homogeneous population than teachers in general offers hope that a more clear-cut profile will emerge from the data.

The Prognosis of Success in Music Teaching

The Music Supervisors National Conference passed the following Resolution at its 1930 meeting:

---

[3]Thomas A. Ringness, "Relationships Between Certain Attitudes Toward Teaching and Success," Journal of Experimantal Education, XXI (1952) 1-55.

[4]Harvey Charles, "The Use of a Selected Projective Technique in the Teacher Selection Process," Studies in Education, Abstracts of Theses, 1952 (Bloomington: Indiana University, 1953).

Be it resolved, that institutions for the training
of teachers and supervisors of school music be urged
to exercise greater care in the selection of students
who seek to undertake this training, by demanding not
only that they have adequate previous musical study,
but also the assurance that they possess possibilities
of necessary future development.[5]

In 1932, Lowell Mason Tilson made the following state-

ment which laid the foundation for all music teacher prognosis

studies since that time:

If there are great individual differences in the
native music endowment of the students who decide to
enter upon courses leading to licenses for teaching
and supervising music in the public school it is very
important that instructors in charge of such courses
know how to select students who are most likely to
succeed, and to eliminate those who are almost sure
to fail. This selection and elimination should not be
attempted except upon the basis of carefully evaluated
results of music talent tests.[6]

Although the prognosis of success in music teaching

is not the primary purpose of this study, five of these

types of investigations from the literature are relevant to

this study and appear below.

A University of Illinois researcher[7] using the Minnesota

Multiphasic Personality Inventory found that very successful

high school instrumental teachers were less neurotic, less

---

[5]Minutes of the Music Supervisors National Conference,
cited by Lowell Mason Tilson, "Music Talent Tests for Teacher-
Training Purposes," Journal of Experimental Education, XVIII
(1932), 26.

[6]Ibid.

[7]Warren Lutz, "Personality Characteristics and Experi-
ence Backgrounds of Successful High School Instrumental Music
Teachers" (Unpublished Doctoral Dissertation, University of
Illinois 1963).

moody, worked harder, and were more satisfied with their profession than were less successful teachers.

Using the same MMPI test, another Illinois study[8] found that music teachers with the highest festival ratings were cool, aloof, optimistic and methodical. Directors with lower ratings tended to be gloomy, depressed, sensitive, religious and had difficulty with authority figures. Thirty instrumental music teachers were involved in the study.

In 1961 a University of Southern California researcher[9] was unable to find significant differences between 156 selected music teachers and 160 randomly selected ones. The Thurstone Temperament Schedule and the Sixteen Personality Factors Test. were used. However, when the 316 teachers were redivided according to "job satisfaction" the tests discriminated very well.

Anderson[10] found that music students who did better in student teaching differed from those who did less well on

---

[8]John Fosse, "The Prediction of Teacher Effectiveness: An Investigation of Relationships Among High School Band Contest Ratings, Teacher Characteristics, and School Environmental Factors" (Unpublished Doctoral Dissertation, University of Illinois, 1965).

[9]George Barth, "Some Personality and Temperament Characteristics of Selected Music Teachers" (Unpublished Doctoral Dissertation, University of Southern California, 1961).

[10]John Martin Anderson, "The Use of Musical Talent, Personality and Vocational Interest Factors in Predicting Success for Student Music Teachers" (Unpublished Doctoral Dissertation, University of Southern California, 1965).

certain personality and vocational interest tests. Specifically, the objectivity and masculinity scales from the Guilford-Zimmerman Temperament Survey and the symbol reproduction scale from the Project Potential Creativity Battery showed promise in selecting and counseling future music student teachers. Anderson failed to find differences between nineteen successful student teachers and a group of ten master teachers.

Turrentine[11] investigated the SAT, an IQ test, high school GPA, and various college GPA's as predictors of success in music student teaching. The best single predictor of success was the GPA for teacher training courses; however, the correlation was only .564. The second best predictor was high school GPA, and all other variables correlated rather low.

Relevant Studies with Music Majors

Since such populations as "students," "student teachers," and "professionals" are extremely heterogeneous, encompassing many subject matter fields, it would seem necessary to look at research concerning college music students only. Perhaps music students represent a relatively homogeneous population for which definite criteria can be established. If this is true, music education students and practicing music

---

[11]Edgar Turrentine, "Predicting Success in Practice Teaching in Music" (Unpublished Doctoral Dissertation, University of Iowa, 1962).

educators may be even more homogeneous as a group than are all "musicians."

An early attempt at setting levels for entrance into advanced courses in a music teaching training program was by Tilson.[12] His purpose was the validation of the Seashore Musical Talent Tests and a standardized intelligence test for use in deciding which students should be permitted to enter courses intended for the training of music supervisors. Tilson found that those students scoring in the lowest quartile on the music talent tests should be discouraged from enrolling in freshman music courses, regardless of intelligence test scores. Students scoring in the lowest quartile on both tests should positively be eliminated from the music program.

The Tilson study was one of the first attempts to study the relationships of music talent, course grades, and intelligence. He found correlations of .399 between music talent scores and grades in ear training, and .340 between intelligence and grades in ear training. These correlations are rather low and are of little value in predicting success in ear training.

Another early study was by More,[13] whose purpose was very much like that of this study. She attempted to validate

---

[12]Tilson, op. cit.

[13]Grace van Dyke More, "Prognostic Testing in Music on the College Level: An Investigation Carried on at the North Carolina College for Women," Journal of Educational Research, XXVI (1932), 199-212.

a battery of tests for use in counseling freshmen music

majors. The test battery included Seashore tests, two tests

of melodic and harmonic sensitivity, a "silent reading"

test, a test of relative pitch, and five tests designed by

the researcher. The latter tests attempted to measure the

students' ability to solve musical problems, primarily the

detection of pitch and rhythmic errors.

The correlations of these test scores with freshman

music grades were very interesting. Although none of the

tests had a higher correlation with grades than .563, the

tests involving problem solving, such as error detection,

correlated higher than those which measured only one factor

of perception. The researcher suggested that future research

consider tests of score reading, error detection, and other

tests which involve musical problem solving.

Stanton[14] used the Seashore Measures of Musical

Talent and the Iowa Comprehension test, a non-musical test,

as a test battery to be given to high school seniors as a

prognosis tool for college music achievement. On the basis

of a combination of the two scores, plus first term theory

grades and ratings by applied teachers, she assigned each

student into one of five categories: Safe, Probable Possible,

Doubtful, and Discouraged. The Safe category included all

---

[14]Hazel M. Stanton, "Testing the Cumulative Key for
Prognosis of Musical Achievement," Journal of Educational
Research, XXVII (1934), 45-53.

those students considered a "Safe" academic risk. At the
other end of the scale, the "Discouraged" category included
those students whose test scores indicated greater odds
against them to the extent that encouragement was not justi-
fied. The categories were established using teachers' ratings
and grades, although the teachers were not aware of the cate-
gory for each student. The students were freshmen entering
Eastman School of Music from 1920 through 1929.

The records of the music students during their four
years of college were used to validate the test battery. More
than half of the "Safe" group continued into the fourth year
of college, compared with two-fifths of the "Probable" group
and none of the "Discouraged." From the percentage of those
dismissed from the School of Music for academic reasons the
increase was from four per cent for the "safe" group to sixty-
four per cent for the "Discouraged."

Further records show that those in the upper groups
gave more recitals, won more scholarships, and earned higher
grades than did those in the lower groups. Using data
gathered over a five year span from 1925 through 1929, Stan-
ton reports that sixty per cent of the "Safe" students were
graduated, forty-two per cent of the "Possible," twenty-three
per cent of the "Doubtful," and seventeen per cent of the
"Discouraged." The results of this study appear significant,
although it is important to note that teachers' ratings were

one of the variables. Certainly, the teachers' expectations of the students biased the results of the study, because other research has shown that students tend to achieve at the level that teachers expect.

Another extensive early study was by E. M. Taylor[15] at the College of Music of Cincinnati. A battery of 22 tests was given to 150 freshmen entering from 1930 through 1935. Coefficients of contingency for scores of these tests and ratings for professional success in music in 1939 ranged from .21 to .62. Grades in sight singing and dictation courses and instructors ratings had coefficients ranging from .50 to .62.

At Indiana University Peterson[16] studied 259 graduate music students who had been given the University of Indiana Test Battery, (which included the pitch, rhythm, and tonal memory sections of the Seashore Measures of Musical Talent, the musical memory sub-test of the Drake, and the Madison Test of Interval Discrimination). He concluded that although the battery will result in a slight improvement over chance selection, its use as a final arbiter is unwarranted. He also found only negligible differences among the various students grouped by curriculum.

---

[15]E. M. Taylor, "A Study in the Prognosis of Music Talent," Journal of Experimental Education, X (1941), 1-28.

[16]Floyd J. Peterson, "A Study of the Relationship Between Music Aptitude and Academic Achievement of Graduate Music Students" (Unpublished Doctoral Dissertation, Indiana University, 1963).

A study by Snapp[17] attempted to develop an interest inventory for use in vocational guidance for musicians. He validated the inventory with active musicians in a number of fields including orchestral playing, college theory teaching, public school teaching, and applied teaching. Snapp concluded that the interests of these groups differed significantly but failed to report any longitudinal validation. His most striking finding was that public school music teachers were the most dissimilar to the other groups of musicians in terms of interests.

C. H. Taylor[18] gave a composite picture of a hypothetical student entering the Peabody Conservatory of Music and concluded that if the student failed it would probably be because of personality or emotional difficulties rather than for lack of necessary musical abilities.

Bienstock[19] used some of the variables of the present study when she tried to discover a predictor of college music achievement. Among her findings were: (1) the Kwalwasser-Dykema tests were too unreliable to be used for the

---

[17]Kenneth O. Snapp, "Development of a Musician Interest Inventory for Use in Vocational and Educational Guidance" (Unpublished Doctoral Dissertation, Indiana University, 1953).

[18]C. H. Taylor, "Characteristics of First Year Conservatory Students," Journal of Research in Music Education, I (1953), 105-118.

[19]Sylvia Bienstock, "A Predictive Study of Musical Achievement," Journal of Genetic Psychology, LXI (1942), 135-145.

prediction of individual success in music: (2) there was a

positive correlation between the Kwalwasser-Dykema tests and

success in music theory and applied music, but it was too low

to be of practical value; (3) the most effective measures for

the prediction of success in theory were the IQ scores and

the age of the students, while the least contributive were

the extent of prior music training and performance background.

Gallagher[20] found that music students who scored high

on various standardized tests of music aptitude and achieve-

ment had similar backgrounds, such as socio-economic status,

home environment, and formal study of music.

Stone[21] investigated high school grades, scholastic

aptitude test scores, theory placement test scores, and a

psychological adjustment test as predictors of Freshman GPA's.

The findings were complex but include the following which are

relevant to this study: (1) grades in applied music, music

classroom courses, and non-music courses can be treated as

discrete experimental variables; (2) high school grades were

not found to be the best predictor of overall college GPA;

and (3) theory placement test scores were the single best

---

[20]Fulton D. Gallagher, "A Study of the Relationships
Between the Gordon Musical Aptitude Profile, the Colwell
Music Achievement Tests, and the Indiana-Oregon Music Discrim-
ination Test" (Unpublished Doctoral Dissertation, Indiana
University, 1971).

[21]Michael Horace Stone, "A Study of the Relationships
Between Selected Variables and the Differential Academic
Achievement of Freshmen in the University of Michigan School
of Music" (Unpublished Doctoral Dissertation, University of
Michigan, 1969).

predictor of achievement in applied music, all music class-
room courses, as well as non-music courses. This theory
placement test was developed especially for use at the
University of Michigan, where the study took place.

EPPS (Edwards Personal Preference Schedule

Although personality factors are generally thought
to be an important influence on academic achievement and
success in a vocation, only limited success has been achieved
in using them as predictors. The present study begins with
an assumption that the previous limitations of success have
been a result of failing to delimit sufficiently the nature
of the group being predicted. Subtle differences may have
been hidden in the remaining random variance of the proced-
ures. Using music majors rather than a more heterogeneous
population offered hope of some success with personality
tests.

The EPPS has been in constant use since its develop-
ment in 1954 and there is a wealth of related literature in-
cluding many validity and reliability studies. Among the
many uses for this ubiquitous instrument are: prediction in
teacher education; comparison of various groups of teachers
according to needs; descriptions of literally hundreds of
sub-groups of teachers; and comparisons of EPPS scores with
other test batteries and observations.

Lunneborg[22] tried to relate EPPS patterns with academic achievement, but her population were counseling clients in a wide variety of subject matter fields.

> The moral would appear to be that to account for college grades the best predictors are traditional aptitude tests and high school grades unsupplemented by personality measures. Personality patterns have again failed to live up to the hopes of many that they represented the unpredictable variance in school achievement.

Drake

The literature concerning the use of the Drake Musical Aptitude Tests[23] is scarce indeed. Although many reviewers have been impressed with the validity and reliability as published in the manual and researched by Drake himself, few independent investigations have sought to confirm Drake's findings.

Drake reports remarkably good validities using teacher ratings of "talent" as the external criteria. The validity coefficients reported in the manual range from .31 to .91, with a majority attaining a value greater than .58.[24] Concerning predictive validity, Drake states that "scores are highly

---

[22]Patricia W. Lunneborg, "EPPS Patterns and Academic Achievement in Counseling Clients" (Washington University Bureau of Testing, Seattle, April, 1969).

[23]Raleigh M. Drake, Drake Musical Aptitude Tests, 2nd ed. (Chicago: Science Research Associates, Inc., 1957).

[24]Raleigh M. Drake, Manual for the Drake Musical Aptitude Tests (Chicago: Science Research Associates, 1957).

predictive of success in music courses and music schools."[25]
Unfortunately, no data or references are given in the manual
to support this claim, and evidence of any independent re-
search was not found by this writer.

Conclusions

Despite the critical importance of the problem and
years of prodigious research effort, very little is known
for certain about the prediction of success in music, music
teaching, or teaching in general. Some of the findings have been
self-evident ("teachers are friendly and sympathetic"); most
of the rest have simply been inconclusive.

Researchers have attempted to discover or devise
means of predicting success in music schools through person-
ality tests. Findings apparently are not sufficient to
yield a comprehensive predictive device. Many researchers
found that, while certain single variables evidenced some
significant correlations, predictions on this basis would be
spurious. Little is known concerning the relationship of a
person's personality and his association with the arts. No
conclusive evidence has been presented which can support the
rather common notion that people in the arts have unusual
personalities.

Studies dealing with the differences between success-
ful and unsuccessful music majors have also been inconclusive.

---

[25]Ibid.

Specific locally made tests, such as theory tests for entering Freshmen, seem to hold more promise than standardized tests of musical aptitude and achievement.

Batteries of tests have been used, but the literature is unclear concerning treatment of the data obtained from these test batteries. Little evidence of advanced statistical procedures such as vector analysis and analysis of variance can be found. Correlational studies are by far the most prominent.

None of the studies located by the writer approach the problem with the combination of variables used herein. Although the EPPS, Drake, and Aliferis tests have all been widely used for many purposes, the literature concerning their validity for prognosis of college music students is not so plentiful as one might hope. The purpose of this study is to try a unique combination of variables with one of two possible outcomes: (1) a measuring device will be found which will aid in the counseling of music majors, or (2) these particular variables are invalid for counseling and prognosis purposes and therefore should not be used without further study.

CHAPTER III

DESIGN OF THE STUDY

Population and Setting

The students involved in the study were undergraduate students in the Michigan State University Department of Music during the Fall term of 1971. Approximately 475 undergraduate students were coded "music" by the University and constitute the group referred to as "music majors." All had been accepted by the music department to work toward a Bachelor of Music degree.

There was no particular reason to believe that these students differed from the general population of University music students throughout the nation, or were unique when compared to past students at the University. It is impossible to test the latter assumption due to lack of normative data gathered prior to this study.

Data Gathering Procedures

The data for this study were obtained from two sources: the students' academic files and tests administered by the researcher. The Director of Students for the Music Department maintains an academic file for each student in the department.

The files contain such items as grade reports, audition re-
ports, a copy of the student's University admission applica-
tion, and other material pertaining to his academic progress.
In accordance with University academic freedom policy, the
student has complete access to his own file.

The information obtained from the academic files in-
cluded the following:

1. sex
2. curriculum
3. transfer status
4. major instrument
5. enrollment status
6. SAT scores
7. GPA's from previous institutions
8. GPA's from various MSU courses and cumulative
      GPA's.

As the information about each student was collected, it was
recorded according to a code number assigned to that student
by the researcher. This procedure assured that data were
used for research purposes only and the identities of the
particular students were protected.

The information from the files was collected during
the month of October, 1971. All data in this study are to
be considered correct through that month. Any information
which was not in the academic files, such as a missing grade
report, was treated as "missing data" as if the information
had never existed. The statistical treatment of "missing
data" is explained at the end of this chapter.

GPA's taken from the files were computed on whatever
information was available. For instance, if a student had

only taken two of the three terms of Advanced Aural Harmony,
only those two terms were used in computing the Advanced Aural
Harmony GPA.

The second category of data came from various tests
administered by the researcher. These tests were given
during regular music classes from October 21, 1971, through
April 12, 1972. Because individual instructors had to give
permission for their classes to be used for testing, it was
necessary to extend the testing period over approximately
six months, reducing the amount of time students would miss
from regular classroom work during any given term.

Larger classes were chosen in which to give the tests
in order to include the most students with the least duplica-
tion. The classes used for testing were Harmony, Advanced
Harmony, Aural Harmony, Advanced Aural Harmony, and Conduct-
ing. The sizes of these classes ranged from fifty students
to over two hundred. None of the classes was normally taken
by seniors, although a few seniors were in the various classes
being tested. Since the prediction and selection process for
music majors was planned for students no later than the first
term of their junior year, no effort was made to include
seniors in the testing program.

At each testing session the students were told that
the tests were for research pruposes only and that their
anonymity would be protected. In spite of these assurances,
the researcher noted some suspicion, especially when students

were asked to write their names on the test answer sheets.
They were assured that the names merely made it possible for
their scores to be matched with their personal data, but no
names would appear after the data processing had begun.

The researcher also noted some animosity concerning
the use of regular class sessions for testing. Several stu-
dents left the class as soon as they discovered that normal
classroom work was being interrupted. A few left before com-
pleting the tests, verbally expressing to the researcher
their resentment at losing a class session. Others completed
the test but stated that their privacy had been invaded,
especially by the Edwards Personal Preference Schedule.

Attendance at classes is not required by the Univer-
sity, and in the large lecture sessions roll is often not
checked. Consequently, attendance at the testing sessions
did not approach 100% because normal class attendance figures
are not that high. On the other hand, since the testing was
not announced in advance, attendance was not lower than usual.
There was no reason to suspect any systematic bias in the
study due to class attendance. Class absences appeared to
be random.

Independent Variables

To test the hypotheses that any of the dependent
variables discriminate among sub-groups of music students,
six independent variables were established. The information

from the academic files was used in placing the students
in the various levels of each variable. The independent
variables were Class, Curriculum, Instrument, Transfer Status,
Enrollment Status, and Sex. They are each discussed separately
below.

Class

The class of each student was found by checking his
official University status at the beginning of fall term,
1971. Since only undergraduates were considered, students
were placed into four categories: freshmen, sophomores,
juniors and seniors. The senior category was not considered
to be a level of this independent variable for two reasons:
(1) they were not readily available for testing, because no
large classes were designed for seniors, and (2) the selection
process for music majors is normally completed before the
senior year; therefore, scores which seniors make on various
tests were not pertinent to the study. The seniors were a
part of the study only to the extent that their GPA and SAT
scores were used in the various levels of the other independent
variables.

TABLE 1.--Number of Students in Each Class.

Class	Total N	N used for analysis of 19 test variables[a]
Freshman	126	35
Sophomore	97	25
Junior	117	39

[a]includes Drake, Aliferis, and EPPS explained on pages 49-56.

SAT scores were not used by classes because many of those in the junior class were not required to furnish the University these scores when they were admitted in 1969. The ten GPA variables were not used because freshmen, of course, had no GPA's, because they had not yet completed a term.

Curriculum

Although the students working toward a Bachelor of Music degree are classified in one of eight curricula, some curricula contained too few students for any meaningful statistical analysis. Music therapy/music education (a five year degree) students were combined with music therapy students, because their desire for a therapy degree of any type distinguished them as special. Theory majors numbered less than twenty and therefore were deleted from the study for this independent variable. String specialist majors were

combined with music education (instrumental). A fourth category were those students who were music/no major. These had not yet declared a music curriculum. They were deleted from the study for this independent variable.

The numbers of students who had no missing data and were therefore used to test the various hypotheses are listed in Table 2.

TABLE 2.--Numbers of Students in Each Level of Curriculum.

Curriculum	N for 10 Test Var.	N for 19 GPA Var.	N for 2 SAT Var.
Applied Music	19	11	37
Music Therapy	31	21	31
Music Education (Choral)	26	21	33
Music Education (Instr.)	37	36	51
Totals	113	89	152

Instrument

The students were grouped according to the major instrument which they studied. Because of some very small numbers for certain instruments (for example, oboe, bassoon, tuba, and euphonium) the major instruments were grouped into families of instruments for the levels of this independent variable. Even after grouped, some families had an insufficiently large N for analysis. For the purpose of this study,

voice is considered an "instrument" and the harp is considered a member of the string family.

TABLE 3.--Numbers of Students in Each Major Instrument Category.

Instrumental Family	N for 19 Test Var.	N for 10 GPA Var.	N for 2 SAT Var.
Piano	20	25	45
Voice	20	21	47
Brass	21	10	49
Woodwind	23	24	31
Strings	*	*	17
Totals	84	80	190

*N was too small for statistical analysis

Transfer Status

Each student's file indicated whether he entered the University as a Freshman or transferred from another college or university. The following three levels of this independent variable were used: (1) non-transfers, or those who entered the University as Freshmen; (2) transfers, or those who entered the University after attending another college or university; and (3) internal transfers, or those who transferred into the music department after beginning study at Michigan State University in some other discipline or as "no-preference" students.

For students in group two, information was also obtained concerning their previous institutions. The numbers of each of these sub-levels were too small for meaningful comparison of dependent variables.

TABLE 4.--Numbers of Students According to Transfer Status.

Transfer Status	N for 19 Test Var.
Non-transfers	74
Transfers	25
Total	99

SAT scores were not used for this independent variable because transfer students do not furnish these. GPA's were also not used, because grades earned at other institutions are not necessarily comparable to those earned at Michigan State University.

Enrollment Status

Perhaps the most important of the independent variables concerns the students' continuance as music students. The criteria used was the enrollment status of each student during the Spring term of 1973. If a student who was in the study during the Fall of 1971 was still a music student in May of 1973, he was classed as Enrolled. If he was not

enrolled in the department for any reason other than having graduated, he was considered to be Non-enrolled. A total of eighty students were found to be Non-enrolled.

The student may have been Non-enrolled during the Spring term of 1973 for a number of reasons. He may have dropped out for personal or academic reasons. He may have been suspended by the University for academic reasons. He may have changed his major to another University department or he may have transferred to another music department. According to an informal survey of selected non-enrolled students, however, most of the students in this category transferred to other departments within the University.

TABLE 5.—Numbers of Students in Each Level of Enrollment Status.

Status	N for 19 Test Var.	N for 2 SAT Var.
Enrolled	81	59
Non-enrolled	18	43

The GPA's were not considered for this independent variable because the Non-enrolled students all had incomplete GPA's.

Sex

The final independent variable was sex. Table 6 gives the N's for each level of each independent variable.

TABLE 6.--Numbers in Each Level of Sex.

Sex	N for 19 Test Var.	N for 10 GPA Var.	N for 2 SAT Var.
Male	41	41	82
Female	65	62	123

Dependent Variables--Course Grades

Thirty-one dependent variables were used in this study. They are divided into two categories: course grades and test scores. Ten of the dependent variables were grade averages (GPA's) for various combinations of courses. In cases where only some of the courses in a group had been taken before the term of data collection (Fall, 1971), the scores available in the group were averaged. When only one course in a group had been taken, that grade became the GPA. All grades were averaged to one decimal place.

The grading scale at Michigan State University is a numerical scale from 0.0 (failing) to 4.0 (superior). The complete list of numerical grades is as follows: 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, and 4.0. The University author- ized a grade of 4.5 for exceptional work in a course, but

its use was limited. Fewer than 1% of music grades were 4.5.

Students who had earned credit and received grades before Fall of 1968 had letter grades. There were converted by the researcher according to the following formula:

F = 0.0; D = 1.0; C = 2.0; B = 3.0; and A = 4.0.

Two more grades were encountered frequently during the data gathering process. The incomplete grade, "I," was considered missing data unless the transcript showed that the course had been completed. In that case, the new grade was substituted for the "I." The pass grade, "P," is used primarily for performing ensembles and therefore did not enter into any GPA calculations.

Listed below are the ten grade variables along with a brief description of the content of each course.

Variable 1.   Harmony

Music students at the University, regardless of the specific music curriculum, take a sequence of three courses in the Freshman year called Harmony (Music 180, Music 181, and Music 182). The content is similar to many "Freshman Theory" courses at a great number of other music schools. The first few weeks are devoted to fundamentals of written music, including scales, intervals, triads, keys, clefs, and modes. The remainder of the academic year is spent with

traditional harmony, chromatic harmony, and a survey of post-Bach (Classic and Romantic) idioms and forms.

The class meets in a large group lecture situation (usually larger than 150 students) three times a week. In addition, the students attend a small group "lab" one hour per week where they receive individual help, and study keyboard harmony.

Variable 2. Advanced Harmony

This three term sequence of courses (Music 280, Music 281, and Music 282) is what is often called "Sophomore Theory." The course content includes advanced chromatic harmony, impressionism, and twentieth century harmony. The lecture-lab arrangement is similar to Harmony, except that the lecture group is usually fifty per cent smaller due to attrition from the Freshman to the Sophomore year.

Variables 3. and 4. Aural Harmony and Advanced Aural Harmony

All music majors must take two full years of the Aural Harmony sequence, which includes Aural Harmony and Advanced Aural Harmony (Music 183, Music 184, Music 185, Music 283, Music 284, and Music 285). Each course is one credit totaling six credits during the Freshman and Sophomore years.

The class is designed to run concurrently with Harmony and Advanced Harmony. Students meet twice each week in a

large group and also receive additional drill during the
one hour lab, discussed earlier with Harmony. In addition,
students spend much time with a program of tape recordings
designed to supplement class drill. The course content in-
cludes melodic and harmonic dictation, sight singing, and
aural recognition of intervals, scales, and chords.

The two years of Aural Harmony and Advanced Aural
Harmony are generally considered by the students and faculty
to be among the major barriers facing music students, particu-
larly those judged as being "weak" musically. According to
the advisors in the music academic advising office, a number
of students drop out of the department on the basis of their
inability to pass these courses.

Variable 5.
Applied 1

Regardless of the specific music curriculum, each
music major takes applied music lessons each term of the
four years of the degree. For this dependent variable, all
grades for the first three terms of study on the major in-
strument were averaged. Grades for class instruments and
private study of minor instruments were not included.

Variable 6.
Applied 2

For this dependent variable, all grades for the
fourth, fifth, and sixth terms of private study on the major

instrument were averaged and recorded. Class instruments
and minor instruments were not included.

Variable 7.
U College 1

All students at the University, regardless of major
or curriculum, are required to complete four series of courses
in order to graduate. (Some students, those in the Honors
program in particular, have certain courses waived and/or
others substituted.) Two of these series are normally taken
by music majors in the first year of college. Because the
courses are administered by the University College, they are
referred to in this paper as U College courses. The two
series are:

> Natural Science . . . . . . 12 credits
>   (Three 4 credit courses)
> American Thought and Language . 9 credits
>   (Three 3 credit courses)

The grade point average for any or all of these six
courses was computed for the value of the dependent variable
U College 1, regardless of the term taken.

Variable 8.
U College 2

Students in all of the music curricula at the Univer-
sity are advised to take the required University College
course called Social Science in the Sophomore year. This
series includes three courses, four credits each, for a total
of 12 credits. The GPA for these three courses, or those

substituted for them, was computed for this dependent varia-
ble. The computation was made regardless of the year in which
the courses were taken, although approximately 75% of the
music students took these courses in the Sophomore year.

Variable 9.
Cumulative 1

This dependent variable was simply the overall GPA
at the end of the student's last term as a Freshman, includ-
ing all courses taken up to that point. It includes, of
course, certain courses for which separate GPA's were com-
puted for other dependent variables. In that sense it is
not a completely new variable, but a combination of certain
variables with some new information (i.e., courses) added.

Variable 10.
Cumulative 2

This variable is similar to Cumulative 1 except that
it includes all courses through the student's last term as
a Sophomore. Both Cumulative 1 and Cumulative 2 appear on
official University grade reports sent to the department
each term to be filed in the academic files.

Dependent Variables--Test Scores

In addition to the ten grade variables, there were
twenty-one test variables. Nineteen of these were scores
from various tests administered by the researcher, and two

were from standardized academic aptitude tests. The twenty-one test score variables will be discussed below. Because the previously discussed course grade variables are also dependent variables, the numbering of dependent variables will continue from the previous list.

Variables 11. and 12.
SAT-V and SAT-Q

Since its inception in 1926, the College Board Scholastic Aptitude Test[1] has been one of the most prestigious and popular tests of mental ability. While the College Entrance Examination Board is responsible for the SAT, most of the operations, development, updating, and statistical analyses are carried out by the Educational Testing Service, Princeton, New Jersey.

The extent of interest in the SAT as a predictive tool is shown by the bibliography in The Seventh Mental Measurements Yearbook[2] article on the SAT. Over 400 pieces of research are reported and at least 300 of these concern its use as a predictor, usually of success in college work as measured by grades.

The SAT is basically an aptitude test for college study, although it measures a certain amount of achievement in academic studies. It yields two scores: Verbal (SAT-V)

---

[1]Scholastic Aptitude Test (Princeton, New Jersey: College Entrance Examination Board, 1961).

[2]Oscar Buros, The Seventh Mental Measurements Year-Book (Highland Park, New Jersey: The Gryphon Press, 1972).

and mathematical, sometimes called quantitative (SAT-Q). The SAT-V is related to social, political, scientific, artistic, philosophical, and literary areas. The SAT-Q requires as background only the math taught in grades one through nine, but also measures reasoning ability, logical ability, and the perception of mathematical relationships.[3]

The SAT is administered to high school students usually early in their senior year. The Educational Testing Service supervises the nationwide administration and sends the results to the colleges and universities designated by the student. Students wishing to enter Michigan State University as Freshmen are advised by the University to take the SAT and have the scores submitted. Transfer students generally do not furnish SAT scores.

The norms for the SAT were established by the over 10,000 students who took the test in April of 1941. A score of 500 and a standard deviation of 100 was established for the norm for both the SAT-V and SAT-Q. The mean score for the combined test (SAT-V + SAT-Q) for students entering the University in a recent year was 1002, but this may vary slightly from year to year. Other institutions report combined scores from less than 700 to more than 1400.[4]

---

[3]Ibid.

[4]Alexander W. Astin, Predicting Academic Performance in College (New York: The Free Press, 1971), 54.

The University has been requiring SAT scores for entering Freshmen since Fall of 1969. For that reason, only 207 students in the study had these two scores. Transfer students and those entering as Freshmen before Fall of 1969 did not have the scores.

Variable 13. The Drake Musical Aptitude Tests

The Drake test was included in the test battery to provide some measure of music aptitude. According to the test manual, the Drake Tests "have been designed to provide consistent and valid measures of musical aptitudes, and to render sound evidence regarding an individual's potential for a successful career in music."[5] The tests can be used with subjects of any age above eight years. It has been demonstrated that training has no significant effect on Drake scores, giving credence to the claim that it is a true aptitude test.[6]

The Drake Tests are actually four tests, including two equivalent forms measuring musical memory, and two non-equivalent forms measuring rhythm. Of the four tests, only form B of the rhythm test was used in this study for two reasons: (1) the melodic portion of the Aliferis test

---

[5] Drake Manual, op. cit.

[6] Edwin Gordon, "A Study to Determine the Effects of Training and Practice on Drake Musical Aptitude Test Scores" (Unpublished Doctoral Dissertation, University of Iowa, 1958).

(discussed on page 52) is similar to the two musical memory

tests of the Drake, and (2) the test manual suggests that

musically trained subjects be allowed to skip form A of the

rhythm tests since it is easier than form B.

The actual test used (Rhythm, form B, hereafter called

the Drake) consists of fifty items. Each item is exactly the

same type, measuring the ability to maintain a steady beat

in spite of distracting aural stimuli. In each item a particu-

lar beat is given, and the listener counts to himself at the

same rate. Following cessation of the presented beat, the

listener continues to count until told to stop. He then

writes the number he has reached at that point. A distract-

ing beat at another tempo is heard following cessation of the

original beat.

The test manual gives the rationale for this type

item:

> Drake's Rhythm Test has been constructed on the
> principle that a test of musical aptitude should ap-
> proximate life-like musical situations as closely as
> possible. The author has taken the premise that a
> successful musical performer (1) must feel rhythm
> strongly, (2) must be able to maintain a set tempo
> despite distractions, and (3) must be able to main-
> tain accurately a set of tempo before he can take
> musical liberties with rhythm in the form of rubato,
> accelerando or deviations from equally divided beats.[7]

Each subject records his answers on an answer sheet.

The answers are hand scored by simply noting the difference

---

[7]Drake Manual, op. cit.

between the correct answer and the given answer. For example, if the correct answer is "eleven" and the student's answer is "nine," he received a score of "two" on that item. The total of all fifty item scores gives the overall score. A perfect score is zero, meaning that there were no differences between the correct answers and the given answers. In this study, all scores were subtracted from one hundred so that higher numbers would mean better scores.

Variables 14. 15. 16.
Al Mel, Al Har, Al Rhy

The Aliferis Music Achievement Test,[8] by James Aliferis, is a three section test, consisting of Melodic, Harmonic, and Rhythmic sections, each yielding one score. Section one deals with the recognition of melodic elements and idioms. The subject hears a melodic interval or four note melody and is asked to match what he hears with one of four choices given in musical notation.

The second section of the test deals with harmonic elements and idioms. In the first part of the Harmonic section the subject matches four-note piano chord with written notation. In the second section the problem is the matching of sequences of three chords with written notation.

The third section, Rhythmic, measures the subjects' ability to match aural rhythmic elements and idioms with a

---

[8]James Aliferis, Aliferis Music Achievement Test Manual (Minneapolis: The University of Minnesota Press, 1954).

written pattern. The author defines a rhythmic element as a rhythmic figure of one beat duration. A rhythmic idiom is a combination of two elements. The examples played in either case consist of a C major scale in a variety of rhythms.

Sixty-four test items are included, with twenty-six, eighteen, and twenty items in each section respectively.

The test booklets contain brief but clear instructions and also the actual written musical examples for each test item. The booklet has a space for each answer and normally must be hand scored. In this study, machine scored mark sense sheets were adapted and seemed to work satisfactorily for the students, and also eliminated tedious hand scoring. Although the use of separate answer sheets is undoubtedly a slight inconvenience for the subject, there is no evidence that this would lower the reliability of the test. Students at the University regularly use machine scored answer sheets.

The test items are furnished by the publisher on tape, recorded at 7 1/2 ips. The use of this tape causes each test administration to be consistent and is much more satis-factory than playing each item on a piano. High fidelity audio equipment was used for playing the tape.

Variables 16-31. EPPS

The Edwards Personal Preference Schedule (EPPS) was designed to provide convenient measures of a number of rela-tively independent normal personality variables. Some other

instruments, such as the Minnesota Multiphasic Personality Inventory, are designed to measure abnormal personality traits and are useful in clinical settings. The EPPS, on the other hand, has been shown to be useful for research and counseling of relatively normal subjects.

The EPPS provides measures of 15 manifest needs. The name of each variable along with a summary of the manifest needs associated with each, is listed below:

1. Achievement. To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play.

2. Deference.-- To get suggestions from others, to find out what others think, to follow instructions and do what is expected, to praise others, to tell others that they have done a good job, to accept the leadership of others, to read about great men, to conform to custom and avoid the unconventioanl, to let others make decisions.

3. Order.--To have written work neat and organized, to make plans before starting on a difficult task, to have things organized, to keep things neat and orderly, to make advance plans when taking a trip, to organize details of work, to keep letters and files according to some system, to have meals organized and a definite time for eating, to have things arranged so that they run smoothly without change.

4. Exhibition.--To say witty and clever things, to tell amusing jokes and stories, to talk about personal adventures and experiences, to have others notice and comment upon one's appearance, to say things just to see what effect it will have on others, to talk about personal achievement, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannot answer.

5. Autonomy.--To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid responsibilities and obligations.

6. Affiliation.--To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships, to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends.

7. Intraception.--To analyze one's motives and feelings, to observe others, to understand how others feel about problems, to put one's self in another's place, to judge people by why they do things rather than by what they do, to analyze the behavior of others, to analyze the motives of others, to predict how others will act.

8. Succorance.--To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others to be sympathetic and understanding about personal problems, to receive a great deal of affection from others, to have others do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt.

9. Dominance.--To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and influence others to do what one wants, to supervise and direct the actions of others, to tell others how to do their jobs.

10. Abasement.--To feel guilty when one does something wrong, to accept blame when things do not go right, to feel that personal pain and misery sufferred does more good than harm, to feel the need for punishment for wrong doing, to feel better when giving in and avoiding a fight than when having one's own way, to feel the need for confession of errors, to feel depressed by inability

to handle situations, to feel timid in the presence of superiors, to feel inferior to others in most respects.

11. Nurturance.-- To help others when they are in trouble, to assist others less fortunate, to treat others with kindness and sympathy, to forgive others, to do small favors for others, to be generous with others, to sympathize with others who are hurt or sick, to show a great deal of affection toward others, to have others confide in one about personal problems.

12. Change.--To do new and different things, to travel, to meet new people, to experience novelty and change in daily routine, to experiment and try new things, to eat in new and different places, to participate in new fads and fashions.

13. Endurance.--To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to. avoid being interrupted while at work.

14. Heterosexuality.--To go out with members of the opposite sex, to engage in social activities with the opposite sex, to be in love with some- one of the opposite sex, to kiss those of the opposite sex, to be regarded as physically at- tractive by those of the opposite sex, to parti- cipate in discussions about sex, to read books and plays involving sex, to listen to or tell jokes involving sex, to become sexually excited.

15. Aggression.--To attack contrary points of view, to tell others what one thinks about them, to critize others publicly, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence.[9]

---

[9]A. L. Edwards, Edwards Personal Preference Schedule Manual (New York: Psychological Corporation, 1954).

The EPPS is published as a booklet containing 225 pairs of statements and a separate answer sheet. The subject is asked to read each pair of statements and mark the answer sheet according to the statement which is more characteristic of himself. A typical item is given below:

    a.   I like to be the center of attention in a group.

    b.   I like my friends to make a fuss over me when I am hurt or sick.

If neither statement especially appeals to the subject he is asked to make a "forced choice," since each item must be answered for the final scores to be meaningful.

According to the test manual, most college students finish the EPPS in about forty minutes, although there is no time limit. The times for taking the EPPS in this study ranged from twenty-five to sixty-five minutes.

The test may either be hand scored or machine scored, depending on the type of answer sheets used. For reasons of economy, the researcher chose to hand score the EPPS. Answer keys are provided with the test manual, and scoring inaccuracies are minimal.

Reliability

Split-half reliability coefficients, or coefficients of internal consistency, were computed for the nineteen test scores used as dependent variables. These were corrected by the Spearman-Brown formula. Both the reliabilities computed in this study and those reported by the publishers of the various tests are given in Table 7.

TABLE 7.--Reported and Obtained Reliabilities.

Variable	Reported Reliability	Obtained Reliability
Aliferis Mel.	.84	.81
Aliferis Har.	.72	.47
Aliferis Rhy.	.67	.78
Drake	.60 - .90	.88
EPPS		
Achievement	.74	.90
Deference	.60	.80
Order	.74	.79
Exhibition	.61	.77
Autonomy	.76	.74
Affiliation	.70	.80
Introspection	.79	.91
Succorance	.76	.92
Dominance	.81	.90
Abasement	.84	.89
Nurturance	.78	.78
Change	.79	.91
Endurance	.81	.88
Heterosexuality	.87	.89
Aggression	.84	.92

Handling of Missing Data

The lack of complete score profiles for each student resulted in missing data. For instance, if a student did not attend the testing session when the Drake was administered, and that student also had not taken Harmony, the Drake and the Harmony GPA were considered missing data for that student.

Simple statistical procedures such as means, standard deviations, and correlations can be computed for the entire sample of students, regardless of missing data. The N for each variable changes according to the number of students for whom the value is present. Simple correlations can be computed by means of a special "Missing Data" computer program which ignores a particular dependent variable when it is missing on either of the independent variables being correlated.

No computer program was available which would handle missing data in a multivariate analysis of variance. For this statistical procedure it was necessary to use only those students who had no missing data on the variables under consideration. For instance, ninety-nine students had no missing data on the Aliferis, Drake, and EPPS. Only these students were used for that particular multivariate analysis.

Whenever missing data occurred, the student was not in that particular sample, although he might be included in

other samples. The sample of those who took the tests was affected by three factors: (1) those who did not come to class were eliminated; (2) those few who left and refused to complete the test were eliminated; and (3) those who were not taking a class in which testing took place were eliminated. Furthermore, those who had not taken certain courses or sequences of courses were eliminated from the samples using GPA's.

Analysis

Raw data for the various dependent variables were punched onto computer cards, along with the student's coded identification number and numbers identifying the student in each independent variable level. Two computer programs were used: a Missing Data program supplied means, standard deviations, and simple correlations for each of the levels of the independent variables. Another program, written by Jeremy Finn (1968), State University of New York at Buffalo, was used for multivariate analysis.

Multivariate Tests

A multivariate F test is capable of handling any number of dependent variables at one time. It tests for equality of mean vectors ($\mu_1 = \mu_2$) taking into account any correlation among the variables. The primary advantage of the single multivariate test over a number of univariate F tests concerns

the alpha level. The large number of univariate tests would raise the alpha level, greatly increasing the possibility of finding significant differences merely by chance (a Type I error).

The degrees of freedom for the multivariate tests reported in this study do not conform to the usual pattern of univariate tests. In the univariate test, the total degrees of freedom equals N-1, and this total is divided into $df_{between}$ and df_{error}. The degrees of freedom reported on the tables in Chapter IV are approximations of the univariate degrees of freedom appropriate for each multivariate test.

It is possible for the multivariate test to show significance while the various univariate tests do not. This occurred only one time in this study, however. In most cases one or more of the univariate tests are significant when multivariate significance is found. It is only with great caution, however, that one can place much faith in the significance of the univariate tests, for the chance of a Type I error is still present. Any significance found in the univariate tests merely points to an area for further research.

It is also possible for the multivariate test not to be significant while one or more of the associated univariate tests are highly significant. In that case, the common practice is to declare that significance was not found, regardless of the univariate results.

Alpha Levels

Since this was an exploratory study, it was important not to overlook any possible variable which might be promising. To fail to find any differences among the samples is called a Type II error, and setting a high alpha level reduces the chance for a Type II error. For that reason, the alpha level was set a priori at the .05 level. Any more stringent level, such as .01 or .005, would increase the chances of a Type II error.

CHAPTER IV

PRESENTATION OF THE DATA

This chapter consists of three sections. The first concerns the correlation matrix presented in Table 4.1. Each of the more interesting correlation coefficients is discussed and some possible explanations of unusual coefficients are given.

The second section is a review of each of the six hypotheses and summaries of the appropriate statistical procedures used to test each hypothesis.

The third and final portion of the chapter consists of tables and means for the various levels of each independent variable. These means were computed using the "Missing Data" computer program and have varying "N's" depending on data available. No means were included when N was less than ten.

Because the multivariate F tests used to test the hypotheses required complete data on each student, the N's were smaller for the multivariate tests. The exact N's used were given in the Tables in Chapter III.

Correlations

Pearson Product Moment Correlations were computed on all thirty-one dependent variables using the Missing Data

TABLE 8.--Correlations.

	SAT Verbal	SAT Quant.	Aural	Harmony	U College 1	Applied 1	Cum. 1	Ad. Aural	Ad. Harmony	U College 2	Applied 2	Cum. 2	Al. Mel.	Al. Har.	Al. Rhy.	Drake	Achievement	Deference	Order	Exhibit.	Autonomy	Affiliation	Introspect.	Succorance	Dominance	Abasement	Nurturance	Change	Endurance	Heterosex.	Aggression
SAT Verbal	1.00																														
SAT Quant.	.65	1.00																													
Aural	.36	.35	1.00																												
Harmony	.44	.31	.61	1.00																											
U College 1	.64	.50	.49	.65	1.00																										
Applied 1	-.05	.07	.29	.24	.23	1.00																									
Cum. 1	.39	.56	.61	.79	.84	.37	1.00																								
Ad. Aural	.62	.40	.77	.62	.57	.30	.63	1.00																							
Ad. Harmony	.55	.43	.46	.68	.61	.18	.69	.60	1.00																						
U College 2	.74	.43	.40	.54	.73	.15	.68	.46	.63	1.00																					
Applied 2	.04	.07	.10	.26	.24	.67	.42	.30	.31	.20	1.00																				
Cum. 2	.66	.47	.59	.74	.83	.44	.92	.66	.76	.80	.49	1.00																			
Al. Mel.	.28	.31	.66	.42	.22	.04	.14	.44	.24	.05	.01	.25	1.00																		
Al. Har.	.33	.20	.43	.12	.04	-.04	.04	.40	.07	-.01	-.01	.06	.55	1.00																	
Al. Rhy.	.12	.23	.35	.30	.15	.15	.21	.15	.05	.17	.22	.13	.34	.19	1.00																
Drake	-.04	-.03	.01	.07	.09	-.03	.17	-.03	.13	.30	.14	-.12	.01	-.06		1.00															
Achievement	.15	.07	.09	.32	.41	.25	.11	.53	.46	.41	.49	.65	.05	.06	.01	-.04	1.00														
Deference	-.12	-.29	-.06	-.01	-.10	.20	.00	.17	.18	.10	.06	.16	-.04	-.02	-.06	-.01	-.03	1.00													
Order	-.13	-.10	.13	.18	.23	.04	.15	.31	.31	.38	.16	.30	-.04	-.11	-.04	.09	.11	.22	1.00												
Exhibit.	-.11	-.06	.02	.07	.12	.15	.10	.24	.07	.07	.13	.08	-.02	-.01	-.13	-.01	.13	-.06	.02	1.00											
Autonomy	.19	.23	.20	.06	.19	.14	.18	.40	.01	-.05	.08	.04	-.02	.06	.04	-.11	.05	-.24	.18	.11	1.00										
Affiliation	.09	.15	-.13	.19	-.28	-.27	.26	-.24	-.17	-.15	-.42	-.44	.14	.13	.04	.00	-.35	-.04	-.17	-.35	-.24	1.00									
Introspect.	.11	.07	.00	.06	.14	.01	.16	.11	.17	.42	.33	.16	.15	.00	-.06	.02	-.10	.02	-.07	-.20	-.05	.11	1.00								
Succorance	.07	-.04	.12	.21	.10	.01	.09	-.12	.0-	-.03	-.21	-.07	.03	.05	-.03	.04	-.04	-.09	.03	.01	-.24	.16	-.25	1.00							
Dominance	-.14	.14	-.09	-.12	-.04	-.01	-.05	-.35	-.14	-.33	.05	-.10	-.13	-.06	.06	-.10	.04	-.11	-.08	.22	.04	-.24	-.15	-.15	1.00						
Abasement	-.17	-.14	-.08	-.10	-.19	-.23	-.18	-.50	-.14	-.12	-.39	-.37	-.02	-.15	.09	.05	-.31	.16	.11	-.29	-.22	.06	-.02	-.03	-.26	1.00					
Nurturance	.13	.21	.04	-.13	-.14	-.24	-.14	-.10	-.22	-.08	-.28	-.11	.12	.15	-.02	.11	-.12	.04	-.10	-.24	-.29	.00	.10	.16	-.26	.14	1.00				
Change	-.06	-.12	-.08	-.26	-.20	.01	-.16	-.21	-.35	-.13	-.29	-.37	.05	.00	-.05	-.06	-.20	.01	-.08	-.04	.10	.13	.07	-.17	-.09	.00	.20	1.00			
Endurance	-.03	.01	.14	.25	.20	.12	.27	.31	.24	.27	.29	.37	.09	.00	.03	.20	.18	.01	.29	-.17	-.14	-.16	-.03	-.31	-.05	.04	-.09	-.10	1.00		
Heterosex.	.12	.00	-.11	-.09	-.13	.14	-.19	.27	.13	-.03	-.05	-.04	-.18	-.03	.00	.03	-.04	.20	.12	.12	.19	-.19	-.20	.06	-.01	-.18	-.25	-.03	-.34	1.00	
Aggression	.02	.00	-.02	-.14	-.02	.10	.06	-.10	-.08	-.26	.15	-.11	-.07	.04	.11	-.07	.05	-.31	-.10	.18	.25	-.33	-.28	.00	.22	-.14	-.11	-.21	-.04	.17	1.00

computer program. This program uses whatever data are available in computing each value in the correlation matrix. When a subject has no data available for the variables being correlated, he is ignored for that computation, but is included in the other computations. This procedure allows all available subject data to be used, greatly increasing the N and therefore the validity of each correlation in the matrix. Interesting or unusual correlations are discussed below. All correlations not discussed were considered to be "normal" or "expected."

SAT-V

Although high correlations might be expected with the more academic-type studies, such as U. College courses or Harmony, SAT-V also had a strong relationship with Advanced Aural (.62). The correlation with Applied 1 (-.05) is the lowest with a GPA. Apparently, SAT-V is much more closely related with "classroom" grades than with applied music grades.

SAT-Q

This variable had positive but slightly lower correlations with GPA's than did SAT-V. The very low correlation with Applied (.07) was also similar to that of the SAT-V. All other correlations with SAT-Q were considered normal.

Aural (Aural Harmony)

The correlations are fairly high with Harmony (.61) and Cum 1 (.63). The lower correlations with Applied 1 (.28) indicate that Aural Harmony grades are more closely related to "academic" GPA's than to private lesson GPA's.

The highest correlation is with Ad. Aural, indicating a tendency for students to continue making approximately the same grades in the second year of Aural Harmony as the first.

The Aliferis variables correlated positively with Aural, with Al. Mel. (.66) being the highest of the three.

Harmony

The highest correlations were with Cum 1 (.79) and Cum 2 (.74) indicating that Harmony grades give a good indication of a student's overall academic potential. The low correlation with Al. Har. may be due to the fact that Harmony class is not as aurally based as are the Aliferis tests.

U College 1 (Univer-
sity College Fresh-
man courses)

High positive correlations were found with Cum 1 (.84) and Cum 2 (.83). Moderate correlations were found with the other GPA's, Applied 1 (.23) being the lowest. All other Correlations with U College 2 were considered normal.

Applied 1

Very low correlations were found with other variables with the exception of Applied 2 (.67). Applied grades seem to be the most independent among all GPA's, suggesting that ability to make a high grade in a private lesson situation is unique when compared to other academic abilities.

Cum. 1 (Freshman
cumulative GPA)

This variable is a combination of Aural, Harmony, U College 1, and Applied 1 plus any other courses taken in the first year. For that reason, the high correlations with grades shown in Table 8 are to be expected.

Al. Mel. (Aliferis
Melodic Sub-test)

A high positive correlation was found with Aural (.66) and lesser positive correlations were found with Ad. Aural (.44), Al. Har. (.55) and Al. Rhy. (.34). All others were considerably lower.

Al. Har. (Aliferis
Harmonic Sub-test)

The highest correlation was with Al. Mel. (.55). Per-haps the reason so many low correlations occurred with this variable was its own low reliability (r = .47).

Al. Rhy.   (Aliferis
Rhythmic Sub-test)

The low negative correlation with the Drake (-12) in-
dicates that the two tests measure different aspects of rhythm.
An examination of the two tests reveals that the Aliferis is
closely bound to the matching of aural perceptions to written
score, whereas the Drake measures the ability to maintain a
steady beat without regard to written rhythm.

Drake

None of the correlations with the Drake was higher
than .30 (Applied 2) and the rest were lower than .20. This
indicates the uniqueness of the trait which the Drake is
measuring.

EPPS (Edwards Personal
Preference Schedule)

Among the EPPS variables, four consistently correlated
highly with GPA's, but none had much relationship with any
of the test variables. Achievement was positively correlated
with all of the GPA's except Aural. Affiliation, Abasement,
and Nurturance correlated negatively with all GPA's. Per-
haps these scales hold some promise in the search for pre-
dictors of academic success.

Hypotheses

Hypothesis 1

Music students who leave the music department for any reason except graduation will differ on one or more variables from those who remain.

Students were classified enrolled if they were still working for a music degree in April, 1973, 18 months after the study began. All those who had left for any reason except graduation were non-enrolled. Separate "t" tests were performed on each SAT tests for the two groups. The results appear in Table 9.

TABLE 9.--Means and Obtained "t" value for the SAT for students grouped by Enrollment Status.

	enrolled			non-enrolled					
	N	mean	SD	N	mean	SD	df	t	p
SAT-V	59	513	89	43	520	106	110	.39	< .35
SAT-Q	59	499	102	43	514	123	110	.65	< .30

A multivariate F test was performed on nineteen test variables. These include the three Aliferis scores, the Drake scores, and fifteen scores from the EPPS. Table 10 contains the results of that multivariate analysis of variance.

TABLE 10.--Multivariate ANOVA for Nineteen Test Variables[a]
for Students Grouped by Enrollment Status.

Source	df[b]	Multivariate F	P
Between	19	1.0072	<.4627
Within	79		

[a]The nineteen test variables include the Drake, Aliferis, and EPPS.

[b]The degrees of freedom for multivariate F tests are obtained from the computer and represent an approximation of the appropriate univariate degrees of freedom. (Rao's approximation.)

Both the "t" tests and the multivariate F tests indicate a rejection of the hypothesis that enrolled students differ from non-enrolled students. No significant differences were found at the .05 level.

The ten grade variables were not used to test this hypothesis because a larger number of the non-enrolled students left before the end of one year and had too few grades for completed courses.

Throughout this chapter actual "P" values, or probabilities, will be given. This is more exact than merely stating, for example, that "the test is significant at the .05 level of confidence."

Hypothesis II

Music students differ on one or more variables
when grouped according to the specific music
curriculum in which they are enrolled.

The levels of the independent variable curriculum included music education choral, music education instrumental, applied music, and music therapy. Other curricula categories contained too few students for analysis. All thirty-one dependent variables were used in testing this hypothesis. Analysis of variance was used to test the two SAT variables. The results appear in Table 11.

TABLE 11.--Multivariate ANOVA for the Two SAT Tests for
Students Grouped by Curriculum.

Source	df	Multivariate F	P
Between	6	2.6354	<.0167
Within	294		..

A multivariate F test was performed using the ten grade variables. These included Aural, Harmony, Applied 1, U College 1, Cum 1, Ad Aural, Ad Harmony, Applied 2, U College 2, and Cum 2. The results appear in Table 12.

TABLE 12.--Multivariate ANOVA for the Ten Grade Variables[a]
for Students Grouped by Curriculum.

Source	df	Multivariate F	P
Between	20	1.1543	<.3034
Within	140		

[a]The ten grade variables are listed on pages 43-47,
and on the preceding page.

A multivariage F test was performed using the nine-
teen test variables and the four levels of the dependent
variable <u>curriculum</u>. The results appear in Table 13.

TABLE 13.--Multivariate ANOVA for the Nineteen Test Variables
for Students Grouped by Curriculum.

Source	df	Multivariate F	P
Between	57	1.3154	<.0904
Within	179		

Of the three multivariate tests, only the one dealing
with the SAT scores showed significance (p = .0167). This
was sufficient, however, to accept the hypothesis that stu-
dents differ on one or more variables when grouped by the
specific music curriculum in which they are enrolled. The
procedure after finding significance on the multivariate F
test is to make a guarded examination of the univariate tests

of the variables which comprised the multivariate test. The results, as they appear in Table 14, suggest that the SAT-V scores contributed more heavily to the significance of the multivariate test than did the SAT-Q.

TABLE 14.--Univariate ANOVA Results for SAT Tests for Students Grouped by Curriculum.

Variable	Univariate F	P
SAT-V	3.8923	<.0104
SAT-Q	2.2300	<.0872

Hypothesis III

Music students differ on one or more variables when they are grouped according to sex.

For the testing of this hypothesis all thirty-one dependent variables were analyzed using three multivariate F tests. The results of the three F tests appear in Tables 15, 16, and 17.

TABLE 15.--Multivariate ANOVA for Ten Grade Variables for Students Grouped by Sex.

Source	df	Multivariate F	P
Between	10	.7886	<.6255
Within	92		

TABLE 16.--Multivariate ANOVA for Nineteen Test Variables
for Students Grouped by Sex.

Source	df	Multivariate F	P
Between	19	2.0176	<.0153
Within	86		

TABLE 17.--Multivariate ANOVA for the Two SAT Tests for
Students Grouped by Sex.

Source	df	Multivariate F	P
Between	2	8.2362	<.0004
Within	202		

An examination of the results of the three multivariate tests reveals that two of them are significant at the .05 level. A closer look at the associated univariate Analysis of Variance F tests indicates that several were significant and probably contributed to the multivariate significance. The various univariate tests which are significant are summarized in Table 18.

TABLE 18.--Univariate ANOVA Results when Students are Grouped
by Sex.

Variable	Univariate F	P	Level with Higher Value
Al Mel	3.8377	<.05	Females
Deference	4.7336	<.03	Males
Endurance	3.7602	<.05	Females
Het Sex	3.6734	<.05	Males
SAT-Q	8.5465	<.01	Males

Hypothesis IV

Music students differ on one or more variables
when grouped according to their major instrument.

There were four levels of the independent variable
instrument: piano, voice, brass, and woodwinds. The other
families of instruments (organ, strings, and percussion) con-
tained too few students for analysis. All thirty-one depend-
ent variables were analyzed by using three multivariate F
tests. The results of the three tests appear in Tables 19,
20, and 21.

TABLE 19.--Multivariate ANOVA for the Ten Grade Variables
for Students Grouped by Major Instrument.

Source	df	Multivariate F	P
Between	30	2.1252	<.0013
Within	197.3342		

TABLE 20.--Multivariate ANOVA for Nineteen Test Variables
for Students Grouped by Major Instrument.

Source	df	Multivariate F	P
Between	57	1.2481	<.1379
Within	185		

TABLE 21.--Multivariate ANOVA for the Two SAT Tests for
Students Grouped by Major Instrument.

Source	df	Multivariate F	P
Between	8	2.1490	<.0308
Within	366		

On the basis of the three multivariate tests, the
hypothesis that music students differ on one or more variables
when grouped according to their major instrument is accepted.
Two of the three multivariate tests showed significance at

the .05 level. An examination of the individual univariate tests reveals two variables which show promise. The univariate results are summarized in Table 22.

TABLE 22.--Univariate ANOVA Results when Students are Grouped by Major Instrument.

Variable	Univariate F	P
Harmony GPA	6.0031	<.0013
Ad. Harmony GPA	3.7452	<.0145

An examination of Table 26, page   , reveals that string players probably account for the significance of the Harmony and Ad. Harmony differences.

Although the multivariate F test for the two SAT scores was significant (p = .0308), neither of the individual scores was significant alone.

Hypothesis V

There will be no differences among music students on the Aliferis, Drake, or EPPS when students are grouped by class.

There were three levels of the independent variable class: Freshmen, Sophomores, and Juniors. There were a total of nineteen dependent variables which were scores and subscores on the three tests. A multivariate F test was performed and the results are in Table 23.

TABLE 23.--Multivariate ANOVA for Nineteen Test Variables for Students Grouped by Class.

Source	df	Multivariate F	P
Between	38	1.0354	<.4249
Within	162		

The F test failed to reject the hypothesis at the .05 level of significance. Therefore, there is no reason to believe that freshmen, sophomores, and juniors will score differently on the three paper-and-pencil tests used in this study.

Hypothesis VI

Music students who transferred to Michigan State University from other institutions do not differ from students who began at the University as Freshmen on standardized aptitude and achievement tests.

There are two levels of the independent variable transfer status: transfers and non-transfers. A multivariate F test was performed using the nineteen test scores as the dependent variable and transfer status as the independent variable. The results appear in Table 24.

The null hypothesis that music majors will not differ from the established norms on the EPPS is rejected. Ten of the fifteen variables showed that significant differences do exist.[1]

The remaining section of Chapter IV consists of Tables of means for each of the thirty-one variables when the students are divided according to the various levels of the independent variables. The N's given in each table represent the total number of students in each level of the independent variable, although the N's for each individual mean will be somewhat smaller because of missing data. No means are given when N is less than ten.

Certain levels of the independent variables are not included in the tables because the number of students was too small for any meaningful calculations. As an example, "percussion" was omitted in the "major instrument" table because of low munbers. As explained in Chapter III, however, the percussionists were put back into the data pool for the other independent variables.

---

[1]The "t" formula used was $t = \dfrac{\overline{X} - A}{S_x/\sqrt{n}}$ where

$\overline{X}$ = mean of the sample, A = population mean (norms), S_x = standard deviation of the sample and n = number in the sample.

TABLE 26.—Means of 31 Variables by Major Instrument.

Variable	Piano N=78	Voice N=60	Brass N=52	Wood-winds N=70	Strings N=26
SAT Verbal	537	528	525	527	544
SAT Quant.	527	530	563	552	532
Aural Harmony	2.81	2.45	2.63	2.46	3.49
Harmony	3.21	2.68	2.70	2.88	3.61
U. College 1	2.99	2.70	2.73	2.94	3.50
Applied 1	2.80	3.04	3.13	3.36	3.77
Cumulative 1	3.01	2.80	2.90	3.05	3.51
Adv. Aural H.	2.89	2.23	3.17	2.60	3.55
Adv. Harmony	2.77	2.22	2.46	2.95	2.87
U. College 2	2.58	2.45	2.51	2.83	3.14
Applied 2	3.05	3.26	3.33	3.56	3.92
Cumulative 2	3.06	2.86	3.04	3.71	3.48
Aliferis Mel.	17.9	15.2	13.5	15.7	17.3
Aliferis Har.	10.8	8.9	8.6	8.7	8.9
Aliferis Rhy.	15.8	14.0	15.9	16.2	16.3
Drake Rhythm	70.0	70.1	68.3	68.4	69.0

EPPS

Achievement	14.2	14.3	14.9	15.0	18.5
Deference	10.8	10.3	10.9	11.0	11.3
Order	9.5	8.9	8.4	9.7	11.7
Exhibition	13.6	14.6	15.0	13.6	14.8
Autonomy	13.7	13.3	14.5	14.1	14.0
Affiliation	17.0	15.8	15.5	16.5	15.1
Introspection	17.2	18.9	18.5	17.6	18.2
Succorance	13.1	13.7	12.0	12.3	13.1
Dominance	11.6	11.7	13.4	11.9	10.5
Abasement	15.9	14.9	15.2	15.8	13.8
Nurturance	18.0	18.6	16.2	17.4	14.2
Change	16.6	17.0	14.2	16.6	16.1
Endurance	12.8	10.3	11.9	13.0	15.1
Heterosex.	14.7	17.0	17.1	15.1	11.7
Aggression	10.1	11.7	11.9	10.6	10.3

TABLE 27.--Means of 31 Variables by Curriculum Groups.

Variable	Applied N=72	Instr. Mus.Ed. N=124	Choral Mus.Ed. N=97	Mus. Therapy N=80	Mus. Theory N=21	Mus. No Major N=43
SAT Verbal	570	509	506	564	595	510
SAT Quant.	563	542	496	559	584	512
Aural Harmony	2.91	2.37	2.20	2.57	3.06	1.91
Harmony	3.05	2.84	2.78	3.04	3.50	2.52
U. College 1	3.02	2.80	2.68	3.04	2.90	2.62
Applied 1	3.31	3.23	2.98	3.06	2.89	3.12
Cumulative 1	3.13	2.98	2.89	3.02	3.06	2.66
Adv. Aural H.	2.78	2.48	2.45	2.38	3.18	*
Adv. Harmony	2.57	2.73	2.44	2.78	3.33	*
U. College 2	2.59	2.70	2.37	2.51	2.65	*
Applied 2	3.53	3.40	2.03	3.15	3.02	*
Cumulative 2	3.13	3.09	2.85	2.92	3.08	*
Aliferis Mel.	16.8	14.7	15.1	17.0	15.8	14.8
Aliferis Har.	9.6	8.5	9.2	9.7	11.0	9.9
Aliferis Rhy.	14.7	16.9	15.0	15.5	15.5	15.4
Drake Rhythm	72.3	69.4	71.2	66.0	72.4	68.5
EPPS						
Achievement	15.5	15.0	14.0	13.7	14.9	16.3
Deference	11.5	11.2	11.0	10.3	11.2	10.2
Order	10.0	9.0	10.2	9.5	9.8	10.2
Exhibition	15.0	14.1	13.9	13.8	14.6	14.7
Autonomy	14.8	14.2	14.0	13.7	14.1	14.3
Affiliation	16.0	16.0	16.7	16.9	15.8	15.5
Introspection	17.4	17.2	18.7	18.4	18.5	16.3
Succorance	12.2	12.4	12.4	13.4	12.4	13.5
Dominance	9.9	12.6	11.1	12.1	13.8	13.4
Abasement	16.0	15.5	15.4	15.7	14.8	15.2
Nurturance	16.8	16.7	17.5	17.6	18.4	15.9
Change	16.7	14.8	18.4	17.3	15.1	16.2
Endurance	13.6	12.5	12.3	12.0	12.1	12.7
Heterosex.	14.3	17.0	15.6	14.4	13.8	13.5
Aggression	10.2	11.3	10.3	11.1	10.3	11.7

*Insufficient number for meaningful analysis.

TABLE 28.--Means of 31 Variables by Transfer Status.

Variable	Non-Transfers N=336	Transfers N=92
SAT Verbal	533	
SAT Quant.	538	
Aural Harmony	2.44	
Harmony	2.90	
U. College 1	2.83	
Applied 1	3.14	
Cumulative 1	2.97	
Adv. Aural H.	2.53	
Adv. Harmony	2.63	
U. College 2	2.55	
Applied 2	2.78	
Cumulative 2	3.00	
Aliferis Mel.	15.6	15.5
Aliferis Har.	9.0	9.6
Aliferis Rhy.	15.8	15.5
Drake Rhythm	69.6	69.7
EPPS		
Achievement	14.7	14.76
Deference	10.8	11.2
Order	9.6	9.2
Exhibition	14.0	14.4
Autonomy	14.0	14.0
Affiliation	16.6	15.7
Introspection	17.5	18.1
Succorance	13.0	12.3
Dominance	12.1	11.8
Abasement	15.5	16.0
Nurturance	17.1	16.9
Change	16.0	17.2
Endurance	12.7	12.1
Heterosex.	15.4	14.7
Aggression	10.7	11.2

TABLE 29.--Means of 31 Variables by Class.

Variable	Freshmen N=126	Sophomore N=97	Junior N=117
SAT Verbal	516	531	579
SAT Quant.	506	543	604
Aural Harmony		2.87	2.53
Harmony		2.88	3.03
U. College 1		2.88	2.94
Applied 1		3.12	3.25
Cumulative 1		2.92	3.11
Adv. Aural H.			2.68
Adv. Harmony			2.65
U. College 2			2.60
Applied 2			3.34
Cumulative 2			3.08
Aliferis Mel.	14.9	16.6	15.6
Aliferis Har.	8.7	9.6	9.6
Aliferis Rhy.	15.6	16.2	15.7
Drake Rhythm	68.1	70.0	70.4
EPPS			
Achievement	15.3	14.1	14.8
Deference	10.9	10.4	11.3
Order	10.0	9.1	8.9
Exhibition	14.7	13.7	14.0
Autonomy	13.6	14.8	14.2
Affiliation	16.4	16.5	16.1
Introspection	16.9	18.9	18.0
Succorance	13.3	12.9	11.8
Dominance	11.8	11.5	12.9
Abasement	15.6	15.6	15.3
Nurturance	16.6	17.6	17.1
Change	16.0	16.9	16.2
Endurance	13.0	12.4	11.9
Heterosex.	14.4	15.4	16.0
Aggression	10.7	11.0	10.9

TABLE 30.--Means of 31 Variables by Sex.

Variable	Males N=131	Females N=209
SAT Verbal	531	531
SAT Quant.	564	515
Aural Harmony	2.51	2.63
Harmony	2.79	2.96
U. College 1	2.88	2.91
Applied 1	3.19	3.14
Cumulative 1	2.96	3.00
Adv. Aural H.	2.66	2.58
Adv. Harmony	2.57	2.58
U. College 2	2.46	2.61
Applied 2	3.40	3.25
Cumulative 2	3.05	3.02
Aliferis Mel.	15.2	15.9
Aliferis Har.	9.4	9.1
Aliferis Rhy.	16.3	15.4
Drake Rhythm	69.4	69.4
EPPS		
Achievement	14.8	14.8
Deference	11.0	10.8
Order	8.8	9.7
Exhibition	14.3	14.1
Autonomy	14.5	14.0
Affiliation	16.1	16.5
Introspection	17.1	18.2
Succorance	12.3	12.9
Dominance	13.3	11.3
Abasement	15.4	15.5
Nurturance	16.6	17.4
Change	14.8	17.3
Endurance	11.9	13.8
Heterosex.	16.7	14.4
Aggression	11.7	10.4

TABLE 31.--Means of 19 Test Variables by Enrollment
Status after 18 Months.

Variable	Enrolled	Non-Enrolled
Aliferis Mel.	16.1	12.6
Aliferis Har.	8.9	8.3
Aliferis Rhy.	15.9	14.7
Drake Rhythm	69.0	68.6
EPPS		
Achievement	15.1	15.6
Deference	11.1	10.7
Order	9.6	10.0
Exhibition	14.8	13.8
Autonomy	13.2	14.1
Affiliation	16.0	15.9
Introspection	17.7	18.9
Succorance	13.1	13.1
Dominance	12.1	12.7
Abasement	15.1	15.7
Nurturance	17.3	16.2
Change	16.1	15.6
Endurance	13.0	10.6
Heterosex.	15.5	16.4
Aggression	10.7	10.3

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The primary purpose of this study was to discover whether certain variables differentiate among groups of music majors. To that end, thirty-one variables were selected which offered some promise of usefulness based on a review of the literature. These variables included tests of academic aptitude, music aptitude, music achievement, and personality. In addition, ten GPA's were selected as measures of academic work in the first two years of college.

A large number of music majors at Michigan State University were involved in the study, either by their taking various tests, contributing GPA's, or both. The students were then subdivided into sub-groups on the basis of six independent variables. These independent variables were class, curriculum, sex, enrollment status, transfer status, and major instrument.

All of the information about the students was prepared for data analysis by computer. A number of multivariate analyses of variance statistical tests were performed, and simple correlations, means, and variances were obtained.

Conclusions

The conclusions drawn from this study apply only to the sample from which the data were obtained. That which is true for this sample may not be true for students in future years at Michigan State University or students at other Universities and Colleges. Based on the results of this investigation, the following conclusions can be admitted.

1. Music students who leave the music department for any reason except graduation do not score differently on the Drake, Aliferis, EPPS, or SAT.

2. The only variable which differentiates students according to the music curriculum in which they are enrolled is SAT-V. None of the other thirty-one variables results in statistically significant differences.

3. Five variables differentiate between sexes. Males score significantly higher on Deference, Heterosexuality, and SAT-Q, while females score significantly higher on Aliferis Melodic and Endurance.

4. Two variables show significant differences among students grouped by major instrument: Harmony GPA and Advanced Harmony GPA.

5. There are no differences among students according to the class (Freshman, Sophomore, and Junior) on any of the thirty-one variables used in this study.

6. Transfer students do not differ from native students on any of the nineteen test scores.

7. Michigan State University music students differ significantly from published college norms on ten of the fifteen variables of the EPPS. The significance is due largely to sample size, however, and the actual differences may not be considered meaningful.

Discussion

This study came about because of a particular need at Michigan State University. The music department was faced with the dilemna of selecting music education majors for the third year of study, and no selection procedure was then in effect. The immediate reaction of the faculty was to try to discover what other music departments had done and whether or not they were successful. A check revealed that no selection process had been devised and validated which would meet the needs of the University.

Course grades were immediately considered, but much literature supported the intuitive feeling that much more than grades should be considered. The selection of other variables from among the vast array of tests, demographic variables, and other factors was made, partly based on a review of the literature, and partly based on what could be readily obtained. For instance, SAT scores were used simply because they were already available and were being used by

University admissions. It was hoped that this investigation would either support or help reject the use of these variables. If the findings were negative, then more "shotgun" style studies could investigate still more variables. The end result would either be the discovery or development of one definitive tool, or the conclusion that no such tool exists.

This empirical approach to the problem was almost completely without theoretical framework. Whether or not this was a handicap can only be guessed. Certainly, many discoveries in the behavorial sciences have been made without regard for theories. The developers of the Aliferis, Drake, SAT, and EPPS claimed to be operating under a theoretical framework, thereby lending those theories to this study.

Any long term solution to the problem of measuring and predicting success for music majors is going to be difficult to find due to changing grade standards and the changing level of entering students. Between 1958 and 1962, entering freshmen at the University maintained a constant GPA for their first year (2.21) while their scores on an entering College Qualifying Test rose from 120.3 to 135.9. In other words, a constant grading scale was being applied to essentially different student populations. Between 1967 and 1973, however, just the reverse occurred. The students scored slightly lower on standardized tests while GPA's soared dramatically from 2.4 to 2.9.[1]

---

[1]Arvo E. Juola, "Illustrative Problems in College-level Grading," Personnel and Guidance Journal (1968) 29-33.

According to the Evaluation Services department at
Michigan State University, SAT scores are becoming less re-
liable as predictors for students on the low end of the
ability scale. One reason for this might be that students
with low academic ability, and therefore low SAT scores, are
often placed in special classes or given special help. The
average and above average students simply continue to achieve
at their own natural rate and the SAT is a reliable predictor
of their academic potential.

A major problem encountered was that of missing data.
Any testing program of this type which involves using stu-
dents in classes for testing may expect to encounter these
problems: First, faculty are reluctant to give up teaching
time, especially more than once per term. This is, of course,
understandable, especially in large lecture sessions where
each class session must be planned long in advance, and
where make-up of lost time is impossible.

The second problem is the students' resistance to any
test which is a threat, either to their privacy or their self-
esteem. Students are consistently aware of their rights and
are quicker to question any apparent invasion of these rights
than ever before. The purpose of a test is likely to be mis-
understood by some students, and they are extremely apprehen-
sive about being judged on the basis of a few test scores.

Evan as students are convinced of the value of a
test and of its non-threatening nature, getting them to attend

the testing session remains a third major problem. Even in a class which normally has a high attendance rate, many of the students do not feel obliged to attend if they know a "special" test is scheduled. An example of this occurred in this study, when a test was scheduled for a conducting class while the instructor was known to be away from campus. Although the instructor had made every effort to stress the importance of attending the testing session, attendance was approximately half of its normal rate.

A word of caution is in order concerning the interpretation of statistical significance. As sample size grows large, degress of freedom increase to such an extent that statistical significance becomes easier and easier to obtain. The ultimate extension of this would be when sample size reaches that of the population. In that case, any difference at all would be "significant." In this study, for example, a reduction of the sample size from several hundred to less than fifty would have resulted in fewer significant differences being found.

Even after statistical significance is found in any research study, the question of meaningfulness must be addressed. For example, regardless of the level of significance reached using a test score, if the difference in the two sample means is only two points on a scale of several hundred, the meaningfulness of the results can be questioned.

In the case of this study, significant differences were found in a number of instances which related to several of the hypotheses. Upon closer examination of the means given in the tables at the end of Chapter IV, however, one finds that, in most cases, the differences are only a few score points or a fraction of a grade point. Particularly the EPPS scores were only two or three points apart, meaning that two or three different answers by an individual could have associated him with either sample's mean.

The fact that this study failed to find any variable which would distinguish "dropouts" from "survivors" or music education majors from other music students does not mean that such variables do not exist. Based on the literature on the subject, however, one can safely conclude that there will be no simple answer to the problem. Perhaps it is time to stop wasting valuable resources on studies involving paper-and-pencil personality tests, standardized music aptitude tests, and grade point averages. As was stated in the opening chapter, maybe it will be necessary to look at hundreds of different facets of the human mind and how these facets interrelate with each other. Such a solution would certainly involve more sophisticated statistical techniques than are currently in common use by behavioral science researchers.

Another possibility exists which was mentioned in Chapter I. Perhaps "music majors" and other broad categories

are simply too broad to describe. Certainly, the definition
and prognosis for success for other professions have not been
forthcoming. For example, no one has yet described the "typi-
cal physician," much less predicted which nineteen year old
pre-med student will be the most successful physician.

In Chapter III certain correlations from Table 8 were
noted as being interesting, either because of their being
high when not expected, or low when some relationship was ex-
pected by the writer. Some possible explanations for a few
of these correlations are discussed below.

SAT Verbal is a test of word analogies and verbal
reasoning ability. The .62 correlation of SAT-V and Ad-
vanced Aural Harmony is indeed interesting, since aural
harmony is supposedly non-verbal in nature. The strong
positive relationship between the two scores might indicate
that some students who are weak academically (and therefore
would score lower on the SAT-V) have dropped out of music
before they completed Advanced Aural Harmony. The fact that
the correlation of SAT-V with Aural Harmony (a first year
course) is much lower tends to support that contention.

Another possible answer to the unexpected high corre-
lation of SAT-V and Advanced Aural Harmony is that the latter
requires not so much an aptitude for working with aural
stimuli as it requires quick thinking and reasoning under
stress (testing situations), abilities partially measured by

SAT-V. A third possible answer is simply that "good students" have worked hard in high school and score well on the SAT tests. These students continue to be industrious in college, and perhaps dilligence and hard work are primary prerequisites for a high grade in Aural Harmony.

The very high correlation between Cumulative 1 and Cumulative 2 (.92) is expected, since first year grades are included in both. On the other hand, a counselor can safely predict that a student's overall GPA will not change much between the first and second year of college.

The low correlations between applied music and all of the other variables indicate that the ability to make a grade in this area is a relatively independent trait. In a large University applied music teachers have little opportunity to know what the students are doing in other academic areas. Since grading in applied music is partly subjective, it is possible that the teacher's knowledge of a student's work in other classes would alter the teacher's perception of the student's performance ability and therefore the ultimate grade earned. This "expectancy effect" might enter into grading in smaller music schools, where applied teachers teach many other music courses. It seems to have little effect at Michigan State University.

One unexpected benefit of this study was an apparent change in the attitude of some of the students toward the

music education program. This writer worked in the music academic advising office during the time of this study. As the study progressed it was noticed that more and more students were interested in their academic progress, ways to improve their chances of remaining in the music education curriculum, and in alternate programs in the event the students were eliminated from music education.

Because of the testing program, students became aware that the music department was serious in its attempt to eliminate the weaker students from the music education program. The rumor that the College of Education was limiting the number of students admitted to the Junior year of their program was being proven true. The advisors in the music academic advising office, as well as some faculty members, noted that music education was enjoying higher esteem because it was no longer a haven for those denied admission to the other music curricula.

Implications

There are three main implications of this study.

1. Students should not be selected for the music education curriculum on the basis of any one or any combination of the variables in this study. An examination of the tables of means in Chapter IV reveals that music education majors differ only slightly from other music majors. Also, those who leave the department are not particularly different from those who remain.

2. In the counseling of college music students, the variables of this study should not be used to encourage or discourage a student's change in music curricula. Apparently, students in applied music, music theory, music education, music therapy, and even those with no declared music specialty are very much alike. Certain differences are indicated in the tables of Chapter IV, but they are not large enough for most counseling purposes.

3. Statements often made concerning the "personality of music majors" are not entirely justified. It is true that statistical significance was found between college norms and Michigan State University music majors, but the differences were not large enough to be meaningful. The EPPS uses a scale from one to twenty-eight, and the largest difference between means was less than two points.

Suggestions for Further Research

Three suggestions for further research seem the most promising to this researcher:

1. Other types of variables need to be measured. Traditional music and academic aptitude tests have not proven effective; therefore, such attributes as creativity, speech ability and self-concept might be researched. Although standardized tests are already in existence in these areas, special tests for music prognosis purposes should be considered.

2. A follow-up of this study might include the study of attrition at later points in a student's career. A longitudinal study of five or more years is needed, using this data or other data. For instance, after five years it would be interesting to determine the characteristics of those who remained in music and those who left the profession. The raw data used in this study is on file in the music department.

3. Devices other than paper-and-pencil tests need to be considered. One possibility would be a structured interview in which certain information is obtained which can be quantified. Another method for gathering data, about music education students in particular, would be in conjunction with a course early in the college experience. The course might involve visiting public schools, experiencing some small amount of student teaching, or some other activities closely related to actual music teaching.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books

Astin, Alexander W. Predicting Academic Performance in College. New York: The Free Press, 1971.

Buros, Oscar. The Seventh Mental Measurements Yearbook. Highland Park, New Jersey: The Gryphon Press, 1972.

Crawford, Albert B., and Burnham, Paul S. Forecasting College Achievement. New Haven: Yale University Press, 1948.

Drake, Raleigh. Drake Musical Aptitude Tests Manual. Chicago: Science Research Associates, 1957.

Drayer, Adam M. The Teacher in a Democratic Society. Columbus, Ohio: Charles E. Merrill Publishing Company, 1970.

Edwards, Allen L. Edwards Personal Preference Schedule Manual. New York: Psychological Corp., 1959.

Folgen, John K., and Astin, Helen S., and Bayer, Alan E. Human Resources and Higher Education. New York: Russell Sage Foundation, 1970.

Gekoski, Norman. Psychological Testing. Springfield, Illinois: Charles C. Thomas, 1964.

Getzels, J. W., and Jackson, P. W. "The Teacher's Personality and Characteristics," Handbook of Research on Teaching. Edited by N. L. Gage. Chicago: Rand McNally and Co., 1965.

Guilford, J. P. The Nature of Human Intelligence. New York: McGraw-Hill Book Company, 1967.

Guilford, J. P. Psychometric Methods. New York: McGraw-Hill, 1954.

Harris, Chester W., ed. Encyclopedia of Educational Research. New York: The MacMillan Co., 1960.

Holstrum, Lars-Gunnar. Musicality and Prognosis. Sweden:
    Svenska Bok for Laget, 1963.

Lehman, Paul. Tests and Measurements in Music. Englewood
    Cliffs: Prentice Hall, Inc., 1968.

Levin, David. The Prediction of Academic Performance.
    New York: Russell Sage Foundation, 1965.

Siegel, Sidney. Nonparametric Statistics for the Behavioral
    Sciences. New York: McGraw-Hill Book Co., Inc.,
    1956.

Stanley, Julian C., and Hopkins, Kenneth D. Educational and
    Psychological Measurement and Evaluation. Englewood
    Cliffs, New Jersey: Prentice-Hall, Inc., 1972.

Stern, George G. "Measuring Noncognitive Variables in Re-
    search on Teaching," Handbook of Research on Teaching.
    Edited by N. L. Gage. Chicago: Rand McNally and
    Co., 1965.

Stinnett, T. M., ed. The Teacher Dropout. Bloomington,
    Indiana: Phi Delta Kappa Inc., 1970.

Super, Donald E. Appraising Vocational Fitness. New York:
    Harper & Brothers., 1949.

Tyler, Fred T. "The Prediction of Student Teaching Success
    from Personality Inventories," University of
    California Publications in Education. XI Berkeley,
    California: University of California, 1954.

Whybrew, William. Measurement and Evaluation in Music.
    Dubuque, Iowa: William C. Brown Co., 1962.

                        Periodicals

Bach, Jacob O. "Practice Teaching Success in Relation to
    Other Measures of Teaching Ability," Journal of
    Experimental Education, XXI (1952), 57-80.

Barr, A. S. "Problems Associated with the Measurement and
    Prediction of Teacher Success," Journal of Educa-
    tional Research, LI (1958), 695-699.

Barr, A. S., and Eustice, David., and Noe, Edward. "The
    Measurement and Prediction of Teacher Efficiency,"
    Review of Educational Research, XXV (1955), 261-269.

Beinstock, Sylvia. "A Predictive Study of Musical Achievement," Journal of Genetic Psychology, LXI (1942), 135-45.

Charles, Harvey. "The Use of a Selected Projective Technique in the Teacher Selection Process," Studies in Education, Abstracts of Theses, 1952. Bloomington: Indiana University, 1953.

Cornfield, J. and Tukey, J. W. "Average Values of Mean Squares in Factorials," Annals of Mathematical Statistics, XXVII, 907-949.

Ernest, David J. "The Prediction of Academic Success of College Music Majors," Journal of Research in Music Education, (Fall, 1970), 273-276.

Gordon, Edwin. "A Study to Determine the Efficacy of General Intelligence and Musical Aptitude Tests in Predicting Achievement in Music," Council for Research in Music Education, XII (1968), 40-45.

Gross, B., and Seashore, R. H. "Psychological Characteristics of Student and Professional Musical Composers," Journal of Applied Psychology, XXV (1941), 159-170.

Jackson, P. W., and Guba, E. G. "The Need Structure of In-Service Teachers: An Occupational Analysis," School Review, LXV (1957), 176-192.

Juola, Arvo E. "Illustrative Problems in College-Level Grading." Personnel and Guidance Journal. (1968) 29-33.

More, Grace van Dyke. "Prognostic Testing in Music on the College Level: An Investigation Carried On at the North Carolina College for Women," Journal of Educational Research, XXVI (1932).

Ringness, Thomas A. "Relationships Between Certain Attitudes Toward Teaching and Success," Journal of Experimental Education, XXI (1952), 1-55.

Roby, A. Richard. "A Study of the Correlation of Music Theory Grades with the Seashore Measures of Musical Talents and the Aliferis Music Aptitude Test," Journal of Research in Music Education, X (1962).

Stanton, Hazel M. "Psychological Tests--A Factor in Admission to the Eastman School of Music," School and Society, XXIX (1929), 889-891.

Stecklein, John E., and Aliferis, James. "The Relationship
        of Instrument to Music Achievement Test Scores,"
        Journal of Research in Music Education, V (1957),
        3-15.

Taylor, C. H. "Characteristics of First Year Conservatory
        Students." Journal of Research in Music Education,
        I (1953), 105-118.

Taylor, E. M. "A Study in the Prognosis of Music Talent."
        Journal of Experimental Education, X (1941), 1-28.

Tilson, Lowell Mason. "Music Talent Tests for Teaching-
        Training Purposes," Music Supervisors Journal,
        XVIII (1932), 26-27, 61.

Vernon, P. E. "The Psychology of the Composer," Music and
        Letters, XI (1930), 38-40.

White, Adolph. "The Aliferis Music Achievement Test as a
        Predictor of Success in Music Theory," Journal of
        Educational Research, LIV (1961), 315-317.

Wilson, M. Emmett. "The Prognostic Value for Music Success
        of Several Types of Tests," Music Supervisors
        Journal (1932), 83-98.

Unpublished

Anderson, John Martin. "The Use of Musical Talent, Person-
        ality and Vocational Interest Factors in Predicting
        Success for Student Music Teachers." Unpublished
        Doctoral Dissertation, University of Southern
        California, 1965.

Barth, George. "Some Personality and Temperament Character-
        istics of Selected Music Teachers." Unpublished
        Doctoral Dissertation, University of Southern Calif-
        ornia, 1961.

Beaver, Maxie. "Personal Characteristics of Successful Band
        Directors in North Carolina." Unpublished Doctoral
        Dissertation, University of North Carolina, 1973.

Burton, Roger. "The Personality of the Contracted Studio
        Musician." Unpublished Masters Thesis, University
        of Southern California, 1956.

Cooley, John Christopher. "A Study of the Relation Between Certain Mental and Personality Traits and Ratings of Musical Abilities." Unpublished Doctoral Dissertation, Michigan State University, 1952.

Davis, Samuel E. "Predicting Probable Failure in College-Level Music Theory Courses." Unpublished Doctoral Dissertation, University of Montana, 1968.

Duda, Walter. "The Prediction of Three Major Dimensions of Teacher Behavior for Student Teachers in Music Education." Unpublished Doctoral Dissertation, University of Illinois, 1961.

Ehlert, Jackson K. "Selection and Education of Public School Music Teachers." Unpublished Doctoral Dissertation, University of Colorado, 1949.

Ferrell, John W. "A Validity Investigation of the Drake Musical Aptitude Tests." Unpublished Doctoral Dissertation, State University of Iowa, 1961.

Fosse, John. "The Prediction of Teacher Effectiveness: An Investigation of Relationships Among High School Band Contest Ratings, Teacher Characteristics, and School Environmental Factors." Unpublished Doctoral Dissertation, University of Illinois, 1965.

Gallagher, Fulton D. "A Study of the Relationships Between the Gordon Musical Aptitude Profile, the Colwell Music Achievement Tests, and the Indiana-Oregon Music Discrimination Test." Unpublished Doctoral Dissertation, Indiana University, 1971.

George, Warren. "Significant Predictors for College Achievement in Specified Areas of Music Education and Identification of Potential Graduates." Unpublished Doctoral Dissertation, University of Kansas, 1969.

Gordon, Edwin. "A Study to Determine the Effects of Training and Practice on Drake Musical Aptitude Test Scores." Unpublished Doctoral Dissertation, University of Iowa, 1958.

Lutz, Warren. "Personality Characteristics and Experience Backgrounds of Successful High School Instrumental Music Teachers." Unpublished Doctoral Dissertation, University of Illinois, 1963.

Megginson, Jean Haydock. "The Relationship of the Edwards
    Personal Preference Schedule Variables to the
    Academic Achievement of Selected University of
    Mississippi Female Students within Five Ability
    Levels." Unpublished Doctoral Dissertation, The
    University of Mississippi, 1971.

Peterson, Floyd J. "A Study of the Relationship Between
    Music Aptitude and Academic Achievement of Graduate
    Music Students." Unpublished Doctoral Dissertation,
    Indiana University, 1963.

Rohrs, D. K. "Predicting Academic Success in Liberal Arts
    College Music Education Programs." Unpublished
    Doctoral Dissertation, University of Iowa, 1962.

Schleuter, Stanley. "An Investigation of the Interrelation
    of Personality Traits, Musical Aptitude and Musical
    Achievement." Unpublished Doctoral Dissertation,
    University of Iowa, 1970.

Schnitzer, Joseph. "Assessment of Certain Personality
    Potentials in Relation to Student Teaching." Un-
    published Doctoral Dissertation, University of
    Minnesota, 1962.

Stone, Michael Horace. "A Study of the Relationships Between
    Selected Variables and the Differential Academic
    Achievement of Freshmen in the University of Michigan
    School of Music." Unpublished Doctoral Dissertation,
    University of Michigan, 1969.

Turrentine, Edgar. "Predicting Success in Practice Teaching
    in Music." Unpublished Doctoral Dissertation,
    University of Iowa, 1962.

Wink, Richard Lee. "The Relationship of Self-Concept and
    Selected Personality Variables to Achievement in
    Music Student Teaching." Unpublished Doctoral
    Dissertation, Ohio State University, 1967.

Woerner, Gerald H. "An Analysis of Certain Criteria of
    Musicianship as Recommended by the Teacher Training
    Curriculum Committee of M. E. N. C." Unpublished
    Doctoral Dissertation, Pennsylvania State University,
    1949.

Miscellaneous

Aliferis, James. *Aliferis Music Achievement Test*. Minneapolis: The University of Minnesota Press, 1954, with manual.

Drake, Raleigh M. *Drake Musical Aptitude Tests*. 2nd ed. Chicago: Science Research Associates, Inc., 1957.

_____. *Manual for the Drake Musical Aptitude Tests*. Chicago: Science Research Associates, 1957.

Edwards, A. L. *Edwards Personal Preference Schedule*. New York: Psychological Corp., 1954, with manual.

Finn, Jeremy. "Univariate and Multivariate Analysis of Variance and Covariance: A Fortran IV Program." Revised by Wright, David J. Occasional Paper No. 9, Office of Research Consultation, College of Education, Michigan State University, 1970.

Lunneborg, Patricia W. "EPPS Patterns and Academic Achievement in Counseling Clients." Seattle: Washington University Bureau of Testing, April, 1969.

Scholastic Aptitude Test. Princeton, New Jersey: College Entrance Examination Board, 1961.