University of New Mexico
UNM Digital Repository

Psychology ETDs | Electronic Theses and Dissertations

Summer 8-8-1949

Possible Factors Influencing Music Preference

Isabella M. Pinto

Follow this and additional works at: https://digitalrepository.unm.edu/psy_etds

 Part of the Experimental Analysis of Behavior Commons, Music Theory Commons, Music Therapy Commons, and the Personality and Social Contexts Commons

Recommended Citation
Pinto, Isabella M.. "Possible Factors Influencing Music Preference." (1949). https://digitalrepository.unm.edu/psy_etds/221

This Thesis is brought to you for free and open access by the Electronic Theses and Dissertations at UNM Digital Repository. It has been accepted for inclusion in Psychology ETDs by an authorized administrator of UNM Digital Repository. For more information, please contact disc@unm.edu.

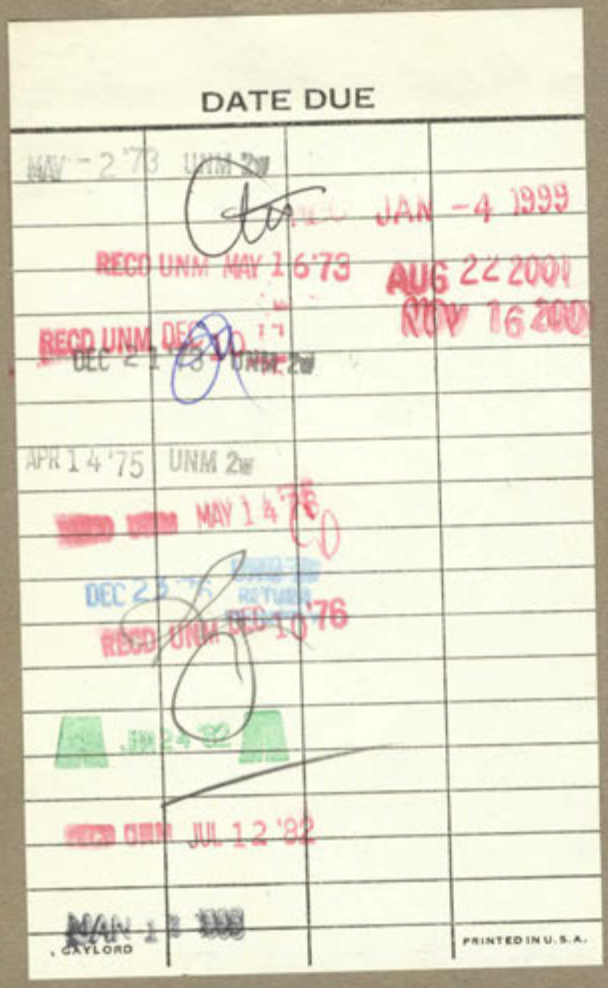
UNIVERSITY OF NEW MEXICO-UNIVERSITY LIBRARIES
A14429 088337

378.789
Un 3 Opi
1950
cop. 2

THE LIBRARY
UNIVERSITY OF NEW MEXICO

Call No.
378.789
Un3Opi
1950
cop.2

Accession
Number
143995


DATE DUE
JAN -4 1999
RECD UNM MAY 16'73
AUG 22 2001
NOV 16 200
APR 14'75 UNM 2w
MAY 14'75
RECD UNM DEC 10'76
JUL 12'82
PRINTED IN U.S.A.

UNIVERSITY OF NEW MEXICO LIBRARY

MANUSCRIPT THESES

Unpublished theses submitted for the Master's and Doctor's degrees and deposited in the University of New Mexico Library are open for inspection, but are to be used only with due regard to the rights of the authors. Bibliographical references may be noted, but passages may be copied only with the permission of the authors, and proper credit must be given in subsequent written or published work. Extensive copying or publication of the thesis in whole or in part requires also the consent of the Dean of the Graduate School of the University of New Mexico.

This thesis by ...Isabelle M. Pinto..... has been used by the following persons, whose signatures attest their acceptance of the above restrictions.

A Library which borrows this thesis for use by its patrons is expected to secure the signature of each user.

NAME AND ADDRESS DATE

POSSIBLE FACTORS INFLUENCING MUSIC PREFERENCE

By

Isabelle M. Pinto

A Thesis

In partial fulfillment of the

Requirements for the Degree of

Master of Arts in Psychology

The University of New Mexico
1949

This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Committee of the University of New Mexico in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

E. H. Castetter

DEAN

Aug. 3, 1949

DATE

POSSIBLE FACTORS INFLUENCING MUSIC PREFERENCE

BY

Isabelle M. Pinto

Thesis committee

Merton J. Peston

CHAIRMAN

Hugh M. Miller

Howard Peterson

378.789
Un30pi
1950
cop.2

TABLE OF CONTENTS

143995

LIST OF TABLES

LIST OF FIGURES

APPENDIX

CALCULATED DATA PAGE

CHAPTER I

THE PROBLEM AND ITS LITERATURE

I. STATEMENT OF THE PROBLEM

The purpose of this study is to determine factors influencing musical preference. The most important factor related to preference for classical music is thought by some to be the cultural background of the listener. According to Lazarsfeld, "there is probably no question so sensitive to social differences as listening to serious music."[1] This is consistent with the opinion of musicians and music critics who state that discriminating musical taste is a result of frequent listening to good music.

In our society, prior to the broadcasting of operatic and symphonic music, opportunity for the development of discriminative taste in music was limited to individuals in the upper economic levels. With the advent of radio, however, all classes had relatively equal opportunity for listening to good music. Nevertheless the data analyzed by the Cooperative Analysis of Broadcasting for the Columbia University Office of Radio Research show that twenty per cent of the

---

[1] P. F. Lazarfeld, Radio and the Printed Page. Duell, Sloane and Pearce, 1940, p. 22.

radio listeners in the three wealthiest economic levels listened to the Ford Hour of classical music while in the lowest of the three groups only thirteen per cent listened to the same program.[2] Twenty-four per cent of the individuals in the highest level preferred classical music and the proportion dropped steadily to the lowest group in which only seven per cent preferred classical music. On the basis of these facts, the question may be raised as to whether or not individuals with similar cultural backgrounds would enjoy the same type of music. However, since this is not the case, it is pertinent to inquire what factors do influence music preference.

This study was carried out with the expectation of revealing several factors which would influence the type of music preferred. The factors investigated were introversion-extroversion, masculinity-feminity, age, educational level, sex, formal musical training, ability to recognize musical compositions, and intelligence.

---

[2] Ibid., p. 22.

II. REVIEW OF THE LITERATURE

A. PREVIOUS RESEARCH IN MUSIC PREFERENCE

Before reviewing the previous research in the field, it might be well to define what is meant by music appreciation. Gernet states that music appreciation is "the power of attentive, discriminative listening and a preference for the better types of music."[3] Individuality and conflict in the esthetic taste are noticeable in all forms of art and particularly in the art of music.[4] Because of this difference of opinion, the question arises as to who has the right to decide what is good music -- or by what standards a composition is judged to be a "better" type of music. To answer this we can only resort to the norms of esthetic judgments which are based upon a wide concensus of expert opinion.

Experimenters have been trying, for years, to answer questions about musical preference. Subjects of all ages have been tested and many interesting but inconclusive facts have been brought to light.

The following studies are a fairly representative

---

[3] Sterling Gernet, Musical Discrimination at Various Age and Grade Levels, p. vii.

[4] Ibid., p. 14.

sample of the research that has been carried on in recent years in the field of music preference.

1. Valentine -- This study concerned preferential differences for chords among children. Valentine concluded that:[5]

   1. Subjects from musical environments with wider opportunities for hearing music began to discriminate concord and discord at an earlier age.

   2. No particular preference for concords as contrasted with discord was indicated by subjects under nine years of age, but the adult mode of reacting is apparently established about the age of twelve or thirteen.

2. Mohler -- A large number of school children were tested by Mohler by means of his "Test for the Appreciation of Orchestral Music".[6] He concluded that:

   1. High general academic ability does not at all imply high ability to judge orchestral music successfully.

   2. Music appreciation is apparently a highly specialized trait, although it seems to be remarkably susceptible to training.

---

[5] Gernet, op. cit., p. 67.

[6] M. R. Trabue, "Scales for measuring judgment of orchestral music", Journal of Educational Psychology, Vol. 14, 1933, pp. 545-561.

3. Cole and Houg -- This is a questionnaire study concerning the musical interests of junior high school pupils.[7] Some interesting facts brought to light were:

1. Popular music is preferred to any other type by this group.
2. Interest in popular songs is very transitory.
3. Pupils are interested in music in its various programmatic forms primarily because of the interesting stories involved.

4. Schultz -- This study is based on the administration of a test devised by Schultz to measure discriminative listening power in music among junior and senior high school and university students.[8] From his results he concludes that:

1. There is an increase in listening power and discriminative musical ability commensurate with the increased span of guided experience for each successive grade.
2. The girls were consistently above the group average and the boys consistently below.

5. Gernet -- A music preference test was administered to 2,546 high school and college students to discover the degree of musical discrimination displayed by students at various

---

[7] A. Jones and C. L. Nemzek, "Children's Interests in Music", School Music, Vol. 30, (November-December, 1933), p. 6.

[8] E. J. Schultz, "Testing Listening Power in Music", Music Educators National Conference Yearbook, 1933, pp. 306-312.

age and grade levels. Gernet formulated a set of assumptions which he presumed basic to a musical response.[9]

1. A subject will respond positively or negatively to a musical work in proportion to his native and acquired sensitivity to the fundamentals of good musical art.

2. Musical judgments are based largely upon pleasure values.

3. Musical preferences are exhibited spontaneously and immediately without reflection or meditation.

4. The facilitating effect of practice, habit and association produce an end-product of pleasure and satisfaction which is basic to the esthetic response.

Some of the conclusions to Gernet's study are:

1. Superior musical taste is a matter of erudition and culture acquired through a favorable environment, intensive training, and extensive experience. Of all the factors correlated with musical preference, musical training bears the closest relationship.

2. There is an almost negligible correlation between music preference and intelligence.

3. A knowledge of the composer's name is no criterion of the ability to identify his compositions.

4. The majority of subjects preferred the more obvious and popular music.

5. There are significant differences in musical training and environmental advantages for girls over boys.

6. The compositions most frequently identified were the compositions more frequently preferred.

---

[9] Gernet, op. cit., p. 21

7. The general tendency for the successive means of musical preference of all ages is upward, but there is some evidence to the fact that musical taste deteriorates in adolescence and slowly rises to maturity.

8. There is a consistent superiority in the preferences of the college group.

6. Fay and Middleton -- Fifty-four students in classes in educational psychology were used in this study of the relationship between musical talent and preferences for different types of music. The subjects were asked to rate the selections on pleasantness or unpleasantness on a scale ranging from +3 to -3.[10]

The conclusions for this study may be summarized as follows:

1. Individuals who prefer swing music are decidedly inferior in sense of pitch, rhythm and time to those who prefer classical music.

2. Individuals who prefer romantic classical music are slightly superior in sense of pitch and rhythm to those who prefer old and modern classical music: they are decidedly superior in musical talent (as measured by the Seashore test) to individuals who prefer light classical music.

3. College students' ratings of classical and swing music are fairly reliable.

4. College students rate classical music higher than popular music.

---

[10] Paul J. Fay and Warren C. Middleton, "Relationship between musical talent and preference for different types of music", Journal of Educational Psychology, 32, 1941, pp. 573-583.

5. College women rate classical music higher than college men rate it; college men rate swing music higher than college women do.

7. Adler -- This is a study of the music preferences of college students to varying sets of musical compositions of varying quality. Each set included an original, a dull, a sentimental, and a chaotic version of works by composers such as Mozart, Brahms, Chopin, and others. Each subject was instructed not to give conscious recognition to so called artistic values, but to make his judgment purely a matter of preference. Adler's main conclusion is that "the possession of knowledge is a positive factor in making a high test score, but high test scores can be made in the total absence of training".[11]

8. Thorpe -- The problem of this study was to discover what type of orchestral selection preparatory and college students of known intelligence prefer when offered the opportunity of listening to a number of well defined musical types under relatively controlled conditions. Thorpe concludes that:[12]

1. There is no appreciable correlation between intelligence and music preference.

---

[11] M. J. Adler, "Music appreciation: an experimental approach to its measurement", Archives of Psychology, Vol. 17, No. 110 (1929-30), pp. 69-83.

[12] Louis P. Thorpe, "The orchestral type preferences of students", Journal of Applied Psychology, (Dec. 1936), pp. 778-782.

2. An individual's ultimate esthetic preferences are the end-product of the cultures and mores to which he has been subject in the sequence of personal experience.

9. Kerr -- This study is of interest because the 415 subjects were factory workers. All the studies previously cited used experimental groups composed of students of various ages and grades. The purpose of this study was to find the music preferences of factory employees of the Atlas Powder Company. These subjects gave the following preference rankings:[13]

1. Hit parade tunes
2. Patriotic tunes
3. Hawaiian tunes
4. Waltzes
5. Polkas
6. Marches
7. Fast dances
8. Sacred music
9. Semi-classic music
10. Hillbilly
11. Humorous-novelty
12. Negro spirituals

The conclusions of this study were:

1. Age or sex has no significant relation to music preferences.

2. Age or level of work has no significant relation to music preferences.

10. American Music Conference -- The National Survey of Public Interest in Music based their findings on a "precision"

---

[13] W. A. Kerr, "Three studies in plant music", Industrial Music News, 1943, 1, pp. 4-5.

sample which gave every element of the population representation in proportion to its size. This sample follows United States census figures on size of family, age, and major occupational groups. The purpose of the study was to discover which of seven general types of music was especially enjoyed by the American people.

The conclusions of this study are:[14]

1. Sharp difference exists in the music preferences of various occupational groups. 55% of those in the executive or professional occupations prefer classical music but only 15% of the farmers prefer classical music.

2. A preference for classical music is highest in the large metropolitan areas.

3. The West coast and the East are strongholds of classical music.

4. For the country as a whole 60% preferred church music, 59% preferred dance music, 54% preferred old favorites and folk tunes, 42% preferred semi-classic and 33% preferred classical music. The total exceeds 100% because some people gave more than one answer.

11. Myers -- In this study of individual differences in listening to music, Myers classified his subjects into four categories:[15]

---

[14] "National survey of public interest in music", American Music Conference, 1948, part IV.

[15] Charles S. Myers, Individual Differences in Listening to Music, pp. 11-17.

1. The intra-subjective who responded to the sensory emotional or cognative implications of the music.

2. The associative who responded to the associative elements of the music.

3. The objective type who responded to the utility value of music.

4. The character types who responded to the subjective character elements personified in the music.

Myers' conclusions in brief are:

1. The presence of associations when music is being listened to is largely dependent upon the esthetic level of the listener.

2. If the attentive level of the musically gifted is lowered, there is a tendency to gain pleasure from associations suggested or aroused by the music rather than from the inherent esthetic value of music.

12. Weld -- This investigation concerned the nature of esthetic experience and the types of reaction patterns usually accompanying such an experience. Weld concludes from an introspective analysis there exist four types of listener: the analytic, the motor, the imaginative, and the emotional.[16] The types may further be described as follows:

1. The analytic whose pleasure is derived from timbre and tone.

2. The motor whose pleasure is a reaction to the rhythm.

3. The imaginative whose pleasure is stimulated by musical imagery and previous experience.

---

[16] Gernet, op. cit., pp. 6-8.

4. The emotional whose pleasure is derived from the mood aroused by the musical stimulus.

13. Keston -- This is the most recent and by far the most carefully planned study in the field. It is of particular interest here because of its experimental design and the statistical procedures utilized. The purpose of this experiment was to make a judgment as to the relative superiority of two different methods of teaching music appreciation.[17] The two methods tested were:

1. exposure to serious classical music with explanatory comments designed to arouse interest in the music to be heard;

2. exposure to serious classical music without comment.

Two groups of senior high school students were organized, an experimental group conducted according to method (1) above and a control group conducted according to method (2) above. Data were collected on all students on the following eleven factors: music preference, music recognition, music accomplishment, music information, Oregon test for music discrimination, pitch, tonal memory, rhythm, intelligence, grade point average, and socio-economic status.

A testing instrument which could determine with

---

[17] Morton J. Keston, "An experimental evaluation of the efficiency of two methods of teaching music appreciation", 1949, Ph. D. thesis, University of Minnesota.

reasonable accuracy the musical discrimination of a given individual was required and because such an instrument was not available, Keston designed the Music Preference Test which is described in another chapter. (See page 20.)

An analysis of variance and covariance performed on the final Music Preference Test scores with the initial Music Preference Test scores held constant revealed that there was a significant difference between the means of the experimental and control groups. Ten further analyses of variance and covariance were then performed on the final Music Preference Test scores with both the initial Music Preference Test scores and each of the ten other independent variables held constant. In each case, there was a significant difference between the means of the experimental and control groups on the final Music Preference Test scores after the necessary adjustments had been made. The conclusion of this experiment is that the method of instruction in music appreciation which utilizes lecture material in conjunction with listening to music is superior to the method of instruction in music appreciation in which music is listened to without comment.

With the possible exception of the Keston experiment, each of the studies cited in this chapter has a number of weaknesses. Not only are the necessary controls lacking, the statistical handling of the data has in most cases been

very elementary. The Keston experiment alone utilizes methods whereby one or another of the variables are held constant at one time. Since music preference is a very complex factor, even in such a case, it would be difficult to know if the variables you were testing were two measures of the same thing, or two different background mechanisms acting in a causal capacity to produce the same effect; namely, significant differences in music preference.

On the basis of the material reviewed in this chapter, it is evident that the factors involved in experimentation in music appreciation are complex and difficult to control. Not only is it extremely difficult to control all variables or to provide a single independent variable, but there is also a serious lack of trained workers interested in the complex experimental designs necessary for experimentation in esthetics. Until this is met, the field will continue to yield few and inconclusive results.

B. EXPERIMENTAL STUDIES OF THE RELATIONSHIP OF PERSONALITY TO AESTHETIC APPRECIATION

Although there has been a wealth of research in the field of music preference as such, there has been little or no research done in the field of personality and musical preference. The work in personality and aesthetic appreciation has been almost completely confined to the fields of art and literature.

On the next few pages will be listed the meager findings of the few experimental studies of aesthetic appreciation and personality.

1. Carroll -- The purpose of this study was to discover the relationship between introversion and aesthetic sensitivity in the field of pictorial art.[18] The Meier-Seashore and Mc Adory art judgment tests were given to measure art appreciation and the Bathurst test was given to measure introversion. A Pearson r of -.18 was found between extroversion and esthetic appreciation as a result of this study.

2. Burt -- This study concerned characteristic differences among picture preferences of extroverts and introverts.

---

[18] H. A. Carroll, "A preliminary report on a study of the relationship between ability in art and certain personality traits", School and Society, 1932, 36, pp. 285-288.

The results of the study state that:[19]

1. Picture preferences of extroverts leaned toward the meaningful, that is the romantic and the realistic.

2. Picture preferences of the introverts leaned toward the formal, that is the impressionistic and the classical.

3. Eysenck -- For this experiment five sets each containing thirty to forty pictures were presented, and the subjects were asked to rank them in order of liking. The Heidbreder and Vetter personality tests were administered to get measures of introversion-extroversion and radicalism-conservatism. Factors were then extracted from the correlated rankings by a method suggested by Burt. The same two factors were active in each of the five sets of pictures; the "T" factor which was a preference for formal rather than the representational type of picture, and the "K" factor which was preference for modern, bright pictures and a preference of color to form.

The findings of this experiment may be summarized as follows:

---

[19] C. Burt, "Correlations between persons", British Journal of Psychology, 1937, 28, pp. 50-96.

[20] Eysenck, "Types -- factors in esthetic judgments", British Journal of Psychology, 1941, 31, pp. 262-270.

1. The "K" factor correlated ⁄.72 with extroversion.
2. The "K" factor correlated ⁄.72 with radicalism and youth.

4. Sisson and Sisson -- This test utilized the Allport-Vernon Scale of Values test on two equated groups, one composed of introverts and the other composed of extroverts.

The chief conclusion drawn was that "the only difference even approaching reliability was between scores for aesthetic value. The mean difference implied that introverts place greater value on the appearance side of things than do extroverts".[21]

5. Coggins, Hensley, and Mull -- The purpose of this study was to discover the relationship between introversion and the appreciation of literature.[22] Sixty seniors at Sweet Briar College were used as subjects. The Bernreuter test was used to measure introversion. The Rigg poetry test and the Carroll prose-appreciation test were used to measure literary appreciation. The Rigg test uses original verses by established poets and one variation from which the subject is asked to select the better. The Carroll test uses

---

21 E. D. Sisson and B. Sisson, "Introversion and the aesthetic attitude", Journal of Genetic Psychology, 1940, 22, pp. 203-208.

22 K. Coggins, R. Hensley and H. K. Mull, "Introversion and the appreciation of literature", American Journal of Psychology, 55, 1942, pp. 560-561.

original passages from established authors and three variations from each passage. These passages are graded by experts and suitably weighted. Here the subjects were asked to rank the passages in order of merit.

The following results were found:

1. Between introversion and poetry appreciation there were Pearson r's of /.24.

2. Between introversion and prose appreciation there existed a correlation of /.19.

3. Between introversion and the combination of poetry and prose, a correlation of /.25 was found.

4. This experiment in the literary field points again to some possible relationship between introversion and esthetic sensitivity.

6. Peters[23] -- This review deals with esthetic experience under three aspects: attitudes, or the response aspect of pleasantness and unpleasantness; perception, or the stimulus aspect of esthetic experience; and experience, or the genetic aspect of affection. In conclusion Peters states:

> "If introversion is the tendency to attend to one's own bodily reactions, including attitudes, and if esthetic judgments are actually reports of observers' attitudes, one would expect introverts to be more familiar with their attitudes than extroverts. And, furthermore, as a consequence of his more frequent esthetic experiences, the introvert would be expected to have abstracted the generalized formal elements of appearance from the particularized meaningful

---

[23] Henry N. Peters, "The experimental study of aesthetic judgments", Psychological Bulletin, 39, 1942, p. 286.

> elements, at least to a greater extent than the extroverts, and consequently show greater relative evaluation of the former."

Since it appears that the greater tendency on the part of the introvert to pay attention to his own reactions, indicates a greater sensitivity to them, he might be expected to be more esthetically sensitive than the extrovert. This is, in part, the basis for the idea which motivated the present study. Although none of the sets of findings reviewed in this chapter are conclusive, the uniformity of the findings is suggestive of a true difference in the esthetic appreciation of introverts and extroverts. One of the purposes of the present study was to determine whether this difference between introverts and extroverts is apparent in musical preference.

CHAPTER II

METHOD OF THE STUDY

A. DESCRIPTION OF THE DATA COLLECTED

The following tests were administered to the students who participated in the study: the Keston Music Preference Test, the Keston Music Recognition Test, and the Heston Personal Inventory; and information concerning music training also was obtained. A detailed description of the tests utilized will be found below.

1. The Keston Music Preference Test.

(a) Description of Music Preference Test. This test consists of thirty items re-recorded on acetate discs. Each item includes four music excerpts, forty-five seconds in length, which were selected according to the following classification:

A. serious classical
B. serious popular classical ("pop concert")
C. light concert selections ("dinner music")
D. popular ("swing", etc.)

The four excerpts are presented in random order, and the student is asked to rank his preference for each of the four excerpts in a given item. This ranking procedure is continued for all thirty items.

(b) Scoring of the Music Preference Test. Since it is important in the administration of the test to randomize the presentation of the categories, the first task in the scoring of the test is to transform the responses of the

subjects to the proper categories. This task is facilitated by means of a transformation table (p. 22). The table is used as follows: the original letter entry is transformed to the letter of the right hand member of each pair. This conversion gives the actual category of music rather than the order in which it is presented. Thus we have, after the transformation, the rank order of the subject's music preference for the thirty items.

For the actual scoring, a system of weightings had to be assigned in such a way that not only would the subject receive full credit for placing the selection in the "proper" ranking, but that he would receive some credit for an approximately "correct" ranking. The students knew nothing about the categories of music used in the test. They were simply asked to rank the selections of each item in the order of their preference. The assumption was made that the "correct" ranking would be A B C D for each item after the appropriate transformations had been made. This assumption was found to be sufficiently justified by the rankings made by a group of experts and several groups of advanced music students.*

The system of weights is based upon four values which were taken from the Fisher-Yates tables.[1] These four values

---

[1] Fisher and Yates, Statistical Tables, Elmer & Boyd, Ltd., London and Edinburgh, p. 20.

*Keston, op. cit., p. 83.

TABLE I

TRANSFORMATION TABLE FOR TABULATION OF MUSIC PREFERENCE TEST

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
A A	A B	A C	A D	A A	A B	A C	A D	A A	A B
B B	B A	B D	B C	B C	B D	B B	B A	B D	B C
C C	C D	C A	C B	C B	C A	C D	C C	C C	C D
D D	D C	D B	D A	D D	D C	D A	D B	D B	D A

11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
A C	A D	A A	A B	A C	A D	A A	A B	A C	A D
B A	B B	B B	B A	B D	B C	B C	B D	B B	B A
C B	C A	C D	C C	C B	C A	C D	C C	C A	C B
D D	D C	D C	D D	D A	D B	D B	D A	D D	D C

21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
A A	A B	A C	A D	A A	A B	A C	A D	A B	A C
B D	B C	B A	B B	B B	B D	B D	B A	B A	B B
C B	C A	C D	C C	C C	C A	C B	C B	C D	C D
D C	D D	D B	D A	D D	D C	D A	D C	D C	D A

have a mean of zero and a standard deviation of one. The rank of one was therefore assigned the value 1.03; the rank of two was assigned the value .30; the rank of three was assigned the value -.30; the rank of four was assigned the value of -1.03.

Since the students had to be penalized according to the degree of departure from the "correct" ranking, a method of difference is used. According to this method, the lower the total score of a student, the more discriminating he would be. A score of 0 would indicate that in every case the student chose classical music as the type he enjoyed most, "pop" concert as the type he preferred second, dinner music as the type he enjoyed third, and jazz as the type he preferred least. The lower the score the less the degree of departure from the "ideal" ranking, which would give a score of 0. The higher the score, the greater would be the degree of departure from the expert or discriminating listener.

The scores are determined according to the weighting indicated in Table II (p. 24).

If a student placed a category "A" selection in rank one, where it should be, he would receive no credit. If he placed this selection in rank two, he would be credited with .73. If this selection (an "A" selection) were placed in

TABLE II

DERIVATION OF WEIGHTINGS USED IN THE SCORING OF THE MUSIC PREFERENCE TEST

(1)	(2)	(3)	(4)	(5)
A 1.03	A 1.03	A 1.03	A 1.03	B 0.30
A 1.03	B .30	C -.30	D-1.03	B .30
0.00	0.73	1.33	2.06	0.00

(6)	(7)	(8)	(9)	(10)
B 0.30	B 0.30	C -.30	C -.30	D-1.03
C -.30	D-1.03	C -.30	D-1.03	D-1.03
0.60	1.33	0.00	0.73	0.00

third place the student would receive 1.33 points. If, however, he judged this item to be the one he liked least, he would be penalized the maximum number of points and would receive 2.06 for this ranking.

The scoring of the music preference test requires first the counting of all A's, B's, C's, and D's in each of the four rankings for all of the thirty items. The weighting of each of the totals is calculated according to Table II, and the sum of these weightings is the total score of the Music Preference Test.

2. The Keston Music Recognition Test. In this test the subjects are asked to indicate which one of thirty-four composers wrote each of thirty classical excerpts which last about forty-five seconds. The test is simply scored. One point is allowed for each correct response. The minimum score is therefore 0, and the maximum score is 30.

3. The Heston Personal Adjustment Inventory. This inventory comprises a list of 270 questions to which the person tested is to answer "Yes" or "No". The questions deal with six aspects of adjustment designated as follows:

A -- Analytical Thinking

S -- Sociability

E -- Emotional Stability

C -- Confidence

P -- Personal Relations

H -- Home Satisfaction

M-F -- Masculinity-Feminity

Of this group of six traits, the three used were "A", "S", and "M-F".

A more detailed description of these traits is described in the Manual.[2]

I. (A) Analytical Thinking -- "This scale which was originally labeled 'Intellectuality', parallels what has often been termed 'Thinking Introversion'. Scores on this scale are not synonymous with intelligence. A person high on "A" likes to be intellectually independent, thinks for himself, analyzes and theorizes a great deal, enjoys solving problems, likes carefully planned and detailed work, is persistent at tasks, and is serious (as opposed to casual). Low scores suggest an uncritical acceptance of others' ideas, a willingness to avoid planning and thinking, and a dislike for creative or intellectual activities."

The following samples illustrate "A", with the scored answers indicated in parentheses:

60. Does conversation help you more than reading in formulating your ideas? (No)

109. Do you critically evaluate the structure of novels and movies? (Yes)

178. Do you find pleasure in solving intellectual problems? (Yes)

---

[2] Heston, Manual for the Heston Personal Adjustment Inventory, World Book Company, Yonkers-on-Hudson, pp. 14-17.

II. (S) Sociability -- "High degree of this trait indicates extroversion in the social sense. A person with a high "S" score is more interested in people than in things, he makes friends easily, converses rapidly and freely, feels he is a 'lively' individual, enjoys social mixing, and frequently takes the lead in social participation. The low person is self-conscious, shy, and socially timid, has only a limited number of friends, and seeks the background on social occasions. He is the introvert who is lacking in social skills and inclinations."

Sample "S" questions and answers are:

219. Have you been concerned about being shy? (No)

168. Are you hesitant to seek assistance from others? (No)

143. Do you generally take the lead in making new friends? (Yes)

III. (M-F) Masculinity-Feminity -- "High scores on this scale denote masculinity and low scores denote feminity. Sixteen items reveal the male to possess more emotional stability, i.e., he recovers more easily after being emotionally upset, his feelings are not as easily hurt, he is not easily startled, his mood is less influenced by others, and in general considers himself less emotional than others."

Sample "M-F" questions are:

39. Does your family feel you are not considerate of them? (No)

49. Can you tackle new situations with a reasonable degree of assurance? (Yes)

98. Do you often have the blues? (No)

The scoring is on a simple unweighted basis, with ready conversion into adequate percentile-norm equivalents. High scores indicate possession of much of the trait measured

and are, in general, preferable, since high scores tend to represent good adjustment and low scores poor adjustment. No item contributes to more than one trait; hence any observed relationships between the various scores are genuine in so far as they are derived from separate measures. The items from the various scales are scattered throughout the test to help conceal the basic traits being investigated.

4. Questionnaire Information. A questionnaire was constructed which gave information concerning the students' reaction to classical music and swing, and information concerning any previous musical training. The training information was quantified according to years of formal musical education. On the following page is a copy of the questionnaire used in this study.

5. A. C. E. Scores. American Council on Education psychological scores were obtained, on the greater majority of the subjects, from the office records. These scores, which were fairly recent, were used as a measure of the intelligence of each student in the study.

B. DESCRIPTION OF THE POPULATION OF THE STUDY

The 202 students used in this study were members of three classes in educational psychology at the University of New Mexico. The sample consisted of: (1) a lower division section, (2) an upper division section, and (3) a summer

Figure I

TRAINING QUESTIONNAIRE USED IN THIS STUDY

Name_____

Year in College_____ Major_____

1. Do you play a musical instrument?

   Which one?

   How long have you studied?

   Have you played in an orchestra or band?

   How long?

2. Does any member of your family play a musical instrument?

3. Have you sung in a chorus or choir?

   How long?

4. Do you attend concerts?

   (a) often

   (b) occasionally

   (c) never

5. How do you react to swing?

   (a) like

   (b) dislike

   (c) indifferent

6. How do you react to classical music?

   (a) like

   (b) dislike

   (c) indifferent

7. Which of the following courses have you taken? Underline.

   Music Appreciation; Music History; Harmony; Ear Training; Sight Singing; Counterpoint; Form and Analysis.

Name_____

Year in College_____ Major_____

1. Do you play a musical instrument?

   Which one?

   How long have you studied?

   Have you played in an orchestra or band?

   How long?

2. Does any member of your family play a musical instrument?

3. Have you sung in a chorus or choir?

   How long?

4. Do you attend concerts?

   (a) often

   (b) occasionally

   (c) never

5. How do you react to swing?

   (a) like

   (b) dislike

   (c) indifferent

6. How do you react to classical music?

   (a) like

   (b) dislike

   (c) indifferent

7. Which of the following schools have you taken? Or terms.

   Music Appreciation; Music History; Harmony; Ear Training; Sight Singing; Conducting; Form and Analysis.

school section. Table III (p. 31) contains pertinent data concerning these sections.

For the 150 upper and lower division students on whom A. C. E. scores were available, the mean was 105.63, which is equivalent to the 48th percentile on the national norms. We can generalize by describing this group as composed of students of average scholastic ability and typical in most other respects of the usual post-war undergraduate. The summer school section, however, was a more heterogeneous group. Some of the students were undergraduates who were making up extra credits. Others were high school teachers with years of experience who were taking supplementary training.

C. DESCRIPTION OF PROCEDURE

In the over-all picture, the procedure amounted to determining the musical preferences of several groups of students and collecting additional data which seemed relevant to the study.

All of the tests administered are group tests and were advantageously administered to the section as a whole. The Keston Music Preference Test requires approximately three hours to administer and was given at three

TABLE III

COMPARATIVE DATA DESCRIBING EXPERIMENTAL GROUPS

Section	N	Age Range	Mean Age	Year in College
Lower Div.	95	17-36	21 yrs.	Fresh. & Soph.
Upper Div.	55	18-44	25 yrs.	Jrs. & Srs.
Sum. Sess.	52	19-55	30 yrs.	Jrs., Srs., & Graduate Stud.

consecutive class meetings. The complete battery took a total of five hours: one for the Music Recognition Test, three for the Music Preference Test, and one for the Heston Personal Adjustment Inventory and the questionnaire. A complete understanding of the nature of the Heston Personality Test and the mechanics of the Music Preference Test was insisted upon before administration. Emphasis was placed upon free and spontaneous responses. Figures II (p. 33) and III (p. 34) contain the instructions for the Music Preference Test and the Music Recognition Test.

In summary, three groups of college students, at different age and instructional levels, were tested for music preference, and additional data were collected on the following factors: music recognition, music training, masculinity-feminity, social introversion, intellectual introversion, intelligence, and age.

Figure II

MUSIC PREFERENCE TEST

There are ten items in this test. Each item consists of four musical excerpts, A, B, C, and D played consecutively with a pause between each. You are to rank these four excerpts in the order in which you liked them best. In each group you may choose only one excerpt as best, one excerpt as second best, and so forth. Therefore, you must place only one letter in each space. This must be done in every case even though you may occasionally doubt your choices. When the test has been completed, there must be one letter in every preference space on the sheet.

Because it is difficult to keep the excerpts in mind, a work column has been provided. If you refer to the example below, you will understand how the work column is to be used.

EXAMPLE ITEM	like best	D	fairly sure	___	1. D 2. ___ 3. B 4. ___ 5. A 6. ___ 7. C 8. ___ 9. ___
	like second best	B			
	like third best	A	not sure at all	___	
	like least	C			

When example A is played, place the letter A in space 5 in the work column. It is placed here because the other letters will range above or below 5 depending upon your preferences. When excerpt B is played, let us suppose you liked it better than excerpt A. You would then place the letter B in space 3 in the work column because you must allow some space between for the letters C and D if you should happen to need it. Now let us suppose that upon hearing excerpt C you liked excerpt C less than A or B. You would then place the letter C in space 7 again allowing space between for the letter D if you should happen to like D better than C but not as much as A. However, let us suppose that you liked D best of all. You would then place the letter D above A, B, and C in space 1 or 2. When you have the letters in the order which suits your preferences, simply copy them carefully in that order in the column to the left, i.e., like best, like second best, etc.

Figure 11

MUSIC PREFERENCE TEST

There are ten items in this test. Each item consists of four musical excerpts, A, B, C, and D played consecutively with a pause between each. You are to rank these four excerpts in the order in which you liked them best. In each group you may choose only one excerpt as best, one excerpt as second best, and so forth. Therefore, you must place only one letter in each space. This must be done in every case even though you may occasionally doubt your choices. When the test has been completed, there must be one letter in every preference given on the sheet.

Because it is difficult to keep the excerpts in mind, a work column has been provided. If you refer to the example below, you will understand how the work column is to be used.

EXAMPLE ITEM

1st best ___B___

2nd best ___D___

3rd best ___A___

4th best ___C___

1.	B
2.	D
3.	A
4.	C
5.	
6.	
7.	
8.	
9.	

When example A is played, place the letter A in space 5 in the work column. It is placed here because the other letters will range above or below 5 depending upon your preferences. When excerpt B is played, let us suppose you liked it better than excerpt A. You would then place in space 3 in the work column because you must allow some space between for the letters C and D if you should happen to need it. Now let us suppose that upon hearing excerpt C you liked excerpt C less than A or B. You would then place the letter C in space 7 again allowing space between for the letter D if you should happen to like D better than C but not as much as A. However, let us suppose that you liked D best of all. You would then place the letter D above A, B, and C in space 1 or 2. When you have the letters in the order which suits your preferences, simply copy them carefully in that order in the column to the left, i.e., 1st best, 2nd best, 3rd best, etc.

Undoubtedly, some excerpts will be familiar to you and others will not. If an excerpt is familiar to you, place a check after that letter and be sure to keep that check with the letter when you copy the list. Thus, in the example above, A and C are familiar excerpts, but B and D are not. Note that the checks occur in both the work column and the final preference column.

Very likely you will be more certain of your preferences for certain of the items than for others. To show how sure you feel about your choices, place a check mark in the space provided. In the example above, let us suppose we were fairly sure that we preferred the excerpts in the order indicated.

This test requires a sincere effort on your part. Concentrate as hard as you can because the test is difficult. Keep in mind that there are no right or wrong answers; it is simply a question of how YOU feel about the music. Therefore, above all, be honest with yourself. Otherwise, the test is a waste of time for all concerned.

- -

	like best ___		1. ___ 2. ___
		fairly sure __	3. ___
	like second best ___		4. ___
<u>PRACTICE ITEM</u>		not sure at all __	5. ___
	like third best ___		6. ___
	like least ___		7. ___ 8. ___ 9. ___

- -

(M. Keston, copyright, 1947)

Figure III

MUSIC RECOGNITION TEST

Name_____ Date_____ Section_____

School_____ Age_____ Grade_____

A portion of each of thirty musical selections will be played. In the space provided place the NUMBER of the composer that you think it to be. For example, if you thought the composer of the first selction played were Chopin, you would place the number 5 in the first space. Fill all the spaces; if you do not know, guess. Note that there are 34 composers and 30 selections.

First	_____	Sixteenth	_____
Second	_____	Seventeenth	_____
Third	_____	Eighteenth	_____
Fourth	_____	Nineteenth	_____
Fifth	_____	Twentieth	_____
Sixth	_____	Twenty-first	_____
Seventh	_____	Twenty-second	_____
Eighth	_____	Twenty-third	_____
Ninth	_____	Twenty-fourth	_____
Tenth	_____	Twenty-fifth	_____
Eleventh	_____	Twenty-sixth	_____
Twelfth	_____	Twenty-seventh	_____
Thirteenth	_____	Twenty-eighth	_____
Fourteenth	_____	Twenty-ninth	_____
Fifteenth	_____	Thirtieth	_____

(M. J. Keston; copyright, 1947)

1. Bach
2. Beethoven
3. Bizet
4. Brahms
5. Chopin
6. Debussy
7. Dvorak
8. Elgar
9. Franck
10. Gershwin
11. Grieg
12. Handel
13. Haydn
14. Herbert
15. Liszt
16. Massenet
17. Mendelssohn
18. Mozart
19. Prokofieff
20. Rachmaninoff
21. Ravel
22. Rimsky-Korsakoff
23. Romberg
24. Rossini
25. Saint-Saens
26. Schubert
27. Schumann
28. Shostakovich
29. Sibelius
30. Richard Strauss
31. Stravinsky
32. Tschaikovsky
33. Verdi
34. Wagner

Figure III

MEMORY RECOGNITION TEST

Name _____ Date _____ Section _____

School _____ Age _____ Grade _____

A portion of each of thirty musical selections will be played. In the space provided place the NUMBER of the composer that you think it to be. For example, if you thought the composer of the first selection played were Chopin, you would place the number 5 in the first space. Fill all the spaces; if you do not know, guess. Note that there are 24 composers and 30 selections.

First	_____	Eighteenth	_____
Second	_____	Seventeenth	_____
Third	_____	Eighteenth	_____
Fourth	_____	Nineteenth	_____
Fifth	_____	Twentieth	_____
Sixth	_____	Twenty-first	_____
Seventh	_____	Twenty-second	_____
Eighth	_____	Twenty-third	_____
Ninth	_____	Twenty-fourth	_____
Tenth	_____	Twenty-fifth	_____
Eleventh	_____	Twenty-sixth	_____
Twelfth	_____	Twenty-seventh	_____
Thirteenth	_____	Twenty-eighth	_____
Fourteenth	_____	Twenty-ninth	_____
Fifteenth	_____	Thirtieth	_____

1. Bach
2. Beethoven
3. Bizet
4. Brahms
5. Chopin
6. Debussy
7. Dvorak
8. Elgar
9. Franck
10. Gershwin
11. Grieg
12. Handel
13. Haydn
14. Herbert
15. Liszt
16. Mascagni
17. Mendelssohn
18. Mozart
19. Prokofieff
20. Rachmaninoff
21. Raval
22. Rimsky-Korsakoff
23. Romberg
24. Sousa
25. Strauss-Sr.
26. Schubert
27. Schumann
28. Tchaikovsky
29. Wolfe
30. Richard Strauss
31. Stravinsky
32. Vaughn-Williams
33. Verdi
34. Wagner

(M. J. Keaton copyright, 1947)

CHAPTER III

PRESENTATION OF THE FINDINGS

The question posed in Chapter I as to which factors influence music preference may now be answered within the limitations of the data of this study.

The statistical tool utilized was the analysis of variance and covariance. The analysis of variance is a technique developed by R. A. Fisher in which the total sum of squares of deviations of the observations from the grand mean may be analyzed into independent portions which are assigned to certain factors. The analysis of covariance is an extension of the analysis of variance and was also developed by Fisher. This process consists of breaking down the sum of products of the deviations from their means into components which may be assigned to specified factors. The analysis of covariance was useful in this study inasmuch as significant differences were found between the means of the different groups in the Music Preference Test scores. By an application of the analysis of covariance, it was possible to adjust these means or to remove from them the influence of various factors in order to determine whether or not these significant differences remain after the adjustment. These

processes, the analysis of variance and the analysis of variance and covariance will be demonstrated in the subsequent analyses.

1. Analysis of the three groups with respect to the Music Preference Test scores.

The Music Preference Test was administered to three different groups: an upper division class, a lower division class, and a summer session class. A summary of this data may be found in Table IV below. The analysis of variance technique was used to test whether significant differences in the means of the groups under consideration were present with respect to Music Preference Test scores.

The basic data for the analysis of variance to be performed on the three groups are included in Table V on the following page.

TABLE IV

MUSIC PREFERENCE DATA FOR THE THREE GROUPS USED IN THIS STUDY

Statistical Measure	Lower Division	Upper Division	Summer Session
Range	36-126	36-146	34-150
Frequency	95	55	52
Mean	103	92	88
Standard Deviation	11.40	24.72	31.24

TABLE V

SUMS AND SUMS OF SQUARES OF MUSIC PREFERENCE TEST SCORES FOR THE UPPER DIVISION, THE LOWER DIVISION AND THE SUMMER SCHOOL SESSION

Section	Number of Students n	Sum of Scores ΣX	Sum of Squares of scores ΣX^2	Sum of Squares About Means $\frac{X^2-(\Sigma X)^2}{n}$
Lower Div.	95	9,803	1,023,914	12,348
Upper Div.	55	5,049	497,159	33,661
Summer Sess.	52	4,570	452,409	50,776
Total	202	19,442	1,973,482	106,086

The last column labeled "Sum of Squares about Means" is usually referred to as the sum of squares of deviations from the mean, Σx^2. As indicated in Table V, the calculation of the quantity 12,348 is performed as follows:

$$1,023,914 - \frac{(9803)^2}{95} = 12,348$$

The hypothesis to be tested by the analysis of variance in this instance is the null hypothesis: there are no significant differences between the means of the groups in the Music Preference Test scores. The usual analysis of variance table is drawn up in Table VI below.

TABLE VI

ANALYSIS OF VARIANCE OF MUSIC PREFERENCE TEST SCORES FOR THE LOWER DIVISION, UPPER DIVISION AND SUMMER SESSION

Source of Variance	df	Sum of Squares	Mean Square	F	Hypothesis
Within	199	96,785	486		
Between	2	9,301	4, 650	9.57	Rejected
Total	201	106,086			

The degrees of freedom of the "between" section is 1 less than the number of sections. The degrees of freedom of the "within" sections is N-k where k is the number of sections, or 202-3. One degree of freedom is lost for each section present.

Referring to the F tables with $n = 2$ and $n = 199$, the table values are 3.04 (5 per cent level) and 4.71 (1 per cent level).[3]

The F ratio of 9.57 is greater than the 1 per cent level, and is therefore significant. We must reject the null hypothesis that there are no significant differences among the means of the three groups in the Music Preference Test scores.

A "t" test was then run on the groups to discover which groups were significantly different from the others. The following formula was used:

$$t = \frac{\text{diff.}}{\sqrt{\frac{\Sigma d^2_1 + \Sigma d^2_2}{n_1 + n_2 - 2}\left[\frac{1}{n_1} + \frac{1}{n_2}\right]}}$$

As indicated in Table VII on the following page, a significant difference was found between the means of

---

[3] Snedievo, George, Statistical Methods, Collegiate Press, Ames, Iowa, p. 224.

TABLE VII

TESTS OF SIGNIFICANCE OF DIFFERENCE IN MEANS OF UPPER DIVISION, LOWER DIVISION, AND SUMMER SCHOOL SECTION IN MUSIC PREFERENCE TEST SCORES

Measure	T Ratio	Probability	Concl.
Lower Div.-Upper Div.	3.616	.01	Sig.
Lower Div.-Summer Sess.	4.166	.001	Sig.
Upp. Div.-Summer Sess.	.727	-	Not Sig.

group one and group two (the upper and lower division sections), and between group one and group three (the lower division section and the summer school section), but there was no significant difference in the means of group two and group three. The scores of the lower division group were significantly higher than either the upper division group or the summer session group. This indicates a higher degree of musical sophistication in the upper division and summer school groups.*

2. Musical Training. The first factor to be investigated is that of musical training. Since musical training data were obtained on only the upper division and the lower division, the summer school group will not enter into this discussion. The music training data for the two groups under consideration will be found in Table VIII (p. 42). There is no significant difference in the amount of musical training between the two groups. However, there is a significant difference in the Music Preference Test scores of those students who had had a year or more of musical training over those who had not had this training. A summary of these data may be found in Table IX (p. 43). A "t" test run between the Music Preference Test scores of the two groups yielded a t ratio of 2.57. This would seem to indicate that music training is an important factor

*Keston, op. cit., p. 103.

TABLE VIII

YEARS OF MUSICAL TRAINING FOR UPPER AND LOWER DIVISION

Statistical Measure	Lower Div.	Upper Div.	t	Concl.
Range	1-15	1-11		
Frequency	35	19		
Mean	5.71	5.26	1.37	Not Sig.
Standard Dev.	3.85	2.90		

TABLE IX

COMPARATIVE DATA FOR MUSIC PREFERENCE TEST SCORES FOR STUDENTS WITH A YEAR OR MORE MUSICAL TRAINING AND STUDENTS WITH NO MUSICAL TRAINING

Statistical Measure	Lower Division	Upper Division	L-U Com.
With one or more years of music training			
Range	36-117	46-122	36-122
Frequency	35	19	54
Mean	98	86	94
Standard Deviation	14.38	24.38	19.43
With no music training			
Range	89-126	36-146	36-146
Frequency	60	34	94
Mean	106	95	102
Standard Deviation	8.12	25.07	17.23

"t" Test

Group	t ratio	Prob.	Concl.
Students with M.T. vs. Students without M.T.	2.57	.01	Signif.

influencing music preference. The question then arises whether there is a significant difference between the means of the Music Preference Test scores of the two groups when the means have been adjusted for the factor of music training. This question may be answered by an analysis of covariance. The null hypothesis to be tested is: there is no significant difference in the means of the Music Preference Test scores of the two groups when the means have been adjusted for music training or the effect of music training is eliminated. Table X (p. 45) includes the data necessary for the analysis. The amount of music training is referred to as "X"; the Music Preference Test scores are referred to as "Y", and the cross product is referred to as "XY".

The procedure at the outset is similar to that of the analysis of variance. Deviation scores must be calculated. The section of Table X so labeled contains the calculated deviation scores. The important feature of the analysis of covariance is that the means for the Music Preference Test scores be freed of the influence of musical training by adjusting the means of the two groups.

Table XI (p. 46) in this process is the analysis of variance and covariance table for the Music Preference Test scores when musical training is held constant.

influencing music preference. The question then arises whether there is a significant difference between the means of the Music Preference Test scores of the two groups when the means have been adjusted for the factor of music training. This question may be answered by an analysis of covariance. The null hypothesis to be tested is: there is no significant difference in the means of the Music Preference Test scores of the two groups when the means have been adjusted for music training or the effect of music training is eliminated. Table X (p. 45) includes the data necessary for the analysis. The amount of music training is referred to as "X"; the Music Preference Test scores are referred to as "Y", and the cross product is referred to as "XY".

The procedure at the outset is similar to that of the analysis of variance. Deviation scores must be calculated. The section of Table X so labeled contains the calculated deviation scores. The important feature of the analysis of covariance is that the means for the Music Preference Test scores be freed of the influence of musical training by adjusting the means of the two groups.

Table XI (p. 46) in this process is the analysis of variance and covariance table for the Music Preference Test scores when musical training is held constant.

TABLE X

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES FOR THE ANALYSIS OF VARIANCE AND COVARIANCE WITH MUSIC TRAINING HELD CONSTANT

Group	N	ΣX	ΣX²	ΣY	ΣY²	ΣXY
			Raw Scores			
Lower Div.	35	200	1,662	3,446	346,515	18,903
Upper Div.	19	100	694	1,638	152,528	8,606
Σ	54	300	2,356	5,084	499,043	27,509

	N	Σx²	Σy²	Σxy
		Deviation Scores		
Lower Div.	35	519	7,232	-788
Upper Div.	19	168	11,400	-15
Σ	54	687	18,632	-803
Total		690	20,394	-735

X= Music Training
Y= Music Preference Score

TABLE XI

ANALYSIS OF VARIANCE AND COVARIANCE OF MUSIC PREFERENCE TEST SCORES HOLDING YEARS OF MUSICAL TRAINING CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced				
					df	S.S.	M.S.	F	Hypothesis
Within	52	18,632	687	-803	51	17,694	346.94		
Between	1	1,762	3	-68	1	1,917	1,917	5.24	Region of doubt
Total	53	20,394	690	-735	52	19,611			

TABLE XI

ANALYSIS OF VARIANCE OF THE SUBMERGED AREA OF LEAVES OF
TWO SPECIES OF AQUATIC PLANTS AT 40 DAYS

Source of variation	SS	df	MS	F
Between	18,032	1	18,032	1,054
Within	205,389	12	17,116	
Total	223,421	13		

Degrees of freedom for F = 1, 12

The F ratio obtained of 5.24 in the analysis of covariance is larger than the table value for the 5 per cent level (4.03) but smaller than the value for the 1 per cent level (7.17). This is often referred to as the region of doubt. We may now accept the null hypothesis at the 1 per cent level, but reject it at the 5 per cent level. The analysis of variance and covariance has indicated that music training may be a factor in music preference, for when the sums of squares about the means of the Music Preference Test are adjusted for the influence of musical training, the level of significance is changed from the 1 per cent level to the 5 per cent level. The adjustment for training in music has reduced this difference between the two groups.

In this process, the sum of squares about the means of the dependent variable, the Music Preference Test, must be adjusted or reduced in order to remove the influence of musical training. The general formula for this adjustment is:

$$\Sigma y'^{2*} = \Sigma y^{2*} - \frac{(\Sigma xy)^2}{\Sigma x^2}$$

$*$ adjusted sum of squares $\quad$ $*$ unadjusted sum of squares

Table XII on the following page indicates the derivation of these values.

2. Age. The data for the comparison of the ages of the three groups may be found in Table III (p. 31).

TABLE XII

DERIVATION OF VALUES FOR ADJUSTMENT FORMULA

	Σy^2	$(\Sigma y)^2$	Σx^2	$\frac{(\Sigma XY)^2}{\Sigma X^2}$	$Xy^2-\frac{(\Sigma xy)^2}{\Sigma y\ \Sigma x^2}$
Upper Div.	7,232	620,944	519	1,196	6,036
Lower Div.	11,400	225	168	-1.3	11,399
	18,632	644,809	687	938	17,694
Total	20,394	540,225	690	783	19,611

An analysis of variance of the three groups revealed a significant difference between the mean ages of the groups. This analysis is contained in Table XIII below.

TABLE XIII

ANALYSIS OF VARIANCE OF MEAN AGES FOR THE LOWER DIVISION, THE UPPER DIVISION, AND THE SUMMER SESSION

Source of Variance	df	Sum of Squares	Mean Square	F	Hypothesis
Within	190	6754	35.5	30.6	Rejected
Between	2	2174	1087		
Total	192	8928			

A t test was run on the three groups to discover which groups were significantly different from the others. As indicated in Table XIV below, a significant difference was found between the means of all three groups in regard to age.

TABLE XIV

TESTS OF SIGNIFICANCE OF DIFFERENCE IN MEAN AGE OF THE THREE GROUPS USED IN THIS STUDY

Measure	T Ratio	Probability	Conclusion
Lower Div.-Upper Div.	4.71	.001	Sig.
Lower Div.-Sum. Sess.	8.57	.001	Sig.
Upper Div.-Sum. Sess.	3.27	.01	Sig.

An analysis of covariance which held constant this inequality was performed. Table XV (p. 51) indicates the data necessary for this analysis. "X" refers to the ages, "Y" to the Music Preference Test scores, and "XY" to the cross products. The null hypothesis tested is: there is no significant difference in the means of the Music Preference Test scores of the upper division and lower division when the effect of age is eliminated.

Table XVI (p. 52) is the analysis of variance and covariance table for the music preference scores for upper and lower divisions when age is held constant. The F ratio obtained is 9.59, which is larger than the tabled value at the 1 per cent level (6.81). Therefore the hypothesis must be rejected. The significant difference between the means of the upper division and the lower division in the Music Preference Test is maintained after the influence of age has been eliminated.

Table XVII (p. 53) is the analysis of variance and covariance table for the music preference scores when age is held constant for the lower division and the summer school section. The F ratio obtained there was 14.7 which is higher than the tabled value for the 1 per cent level, and the null hypothesis is again rejected. As in the preceding case, the significant difference between the

TABLE XV

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES FOR THE ANALYSIS OF VARIANCE AND COVARIANCE FOR THE UPPER AND LOWER DIVISION HOLDING AGE CONSTANT

Group	N	Raw Scores ΣX	ΣX²	ΣY	ΣY²	ΣXY
Lower Div.	92	1,991	44,063	9,496	992,399	202,734
Upper Div.	49	1,234	32,553	4,637	466,137	120,528
Σ	141	3,225	76,616	14,133	1,548,536	323,262

	Deviation Scores Σx²	Σy²	Σxy
Lower Div.	975	12,247	-2772
Upper Div.	1,627	27,325	3752
Σ	2,602	39,572	980
Total	2,853	41,928	7

X= Age
Y= Music Preference Score

TABLE XV

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES FOR THE ANALYSIS OF VARIANCE AND COVARIANCE FOR THE DEFER AND LOWER DIVISION HOLDING AGE SOMATART

Group	N	ΣX	ΣX²	ΣY	ΣY²	ΣXY
Lower Div.	92	1,283	40,063	5,159	992,349	264,734
Upper Div.	49	1,238	32,222	1,637	446,437	327,728
Σ	141	1,522	72,285	14,132	1,438,786	592,462

	Deviation Sums of		
	Σx²	Σy²	Σxy
Lower Div.	772	13,847	-4712
Upper Div.	1,521	21,245	1752
Σ	2,072	35,172	988
Total	2,851	41,918	?

TABLE XVI

ANALYSIS OF VARIANCE AND COVARIANCE OF THE MUSIC PREFERENCE TEST SCORES BETWEEN UPPER DIVISION AND LOWER DIVISION HOLDING AGE CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced				
					df	S.S.	M.S.	F	Hypothesis
Within	139	39,572	2,602	980	138	39,203	284		
Between	1	2,356	251	973	1	2,725	2,725	9.59	Rejected
Total	140	41,928	2,853	7	139	41,928			

TABLE XVI

ANALYSIS OF VARIANCE AND DEVIATION FROM MEAN OF "TOP" SCORES BETWEEN THREE DIFFERENT ROTATING AGE CONCEPTS

Source of Variation	df	SS	MS	F
Between Rotations	2	5,125	2,562	1.52
Within	129	39,803	309	
Total	131	44,928		

TABLE XVII

ANALYSIS OF VARIANCE AND COVARIANCE OF THE MUSIC PREFERENCE TEST SCORES BETWEEN LOWER DIVISION AND SUMMER SCHOOL SECTION HOLDING AGE CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced				
					df	S.S.	M.S.	F	Hypothesis
Within	141	62,099	5,127	-4,351	140	58,407	417		
Between	1	12,705	2,314	5,912	1	6,134	6,134	14.7	Rejected
Total	142	74,804	7,441	-10,263	141	64,541			

mean of the lower division and the summer section in the Music Preference Test scores is maintained when the influence of age is eliminated.

Table XVIII (p. 55) is the analysis of variance and covariance table for the upper division and summer section when age is held constant. The F ratio obtained there was 31.9 which is higher than the tabled value for the 1 per cent level and the null hypothesis, that there is no significant difference in the mean scores of the Music Preference Test for the upper division and summer session when the effect of age is eliminated, is rejected. The fact that the significant difference in Music Preference Test scores for all three divisions is maintained after the effect of age is eliminated indicates that age is not an important factor in music preference.

3. Sex. There is no significant difference in the means of the Music Preference Test scores, the music training scores, the A. C. E. scores, the music recognition scores, the intellectual introversion scores or the social introversion scores when they are classified according to sex. This is not in accord with the studies of Fay and Middleton, who state that college women rate classical music higher than college men and Schultz who states that girls were consistently above the group average and boys consistently below. Our results concur

TABLE XVIII

ANALYSIS OF VARIANCE AND COVARIANCE OF THE MUSIC PREFERENCE TEST SCORES BETWEEN UPPER DIVISION AND SUMMER SCHOOL HOLDING AGE CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced				
					df	S.S.	M.S.	F	Hypothesis
Within	98	62,099	5,779	-4,351	97	58,818	606		
Between	1	16,374	438	-3,070	1	19,391	19,391	31.9	Rejected
Total	99	78,473	6,217	1,281	98	78,209			

with those of Kerr, who stated that there were no significant differences in music preferences of men and women. Table XIX, on the following page, summarizes the sex differences for the principal measures of the study.

4. Masculinity-Femininity. There was a negligible correlation between masculinity-feminity and music preference. A Pearson product moment correlation was run between the Masculinity-Feminity trait in the Heston Personality Inventory and Music Preference Test scores. The formula for this calculation is:

$$r = \frac{N\Sigma XY-(\Sigma X)(\Sigma Y)}{\sqrt{[\Sigma X^2-(\Sigma X)^2][N\Sigma Y^2-(\Sigma Y)^2]}}$$

Substituting the appropriate values which may be found on p. in the Appendix

$$r = \frac{87,907,020-87,603,642}{(7,513,479)(1,288,919)}$$

$$r = .097$$

Referring to the table in Guilford[4] for significant values of r with 147 degrees of freedom and two variables, in order for a correlation coefficient to be significantly different from 0 at the 1 per cent level, a value of .208 is necessary; at the 5 per cent level, the tabled value is .159. Therefore, the correlation coefficient of .097

---

[4] Guilford, Psychometric Methods, Mc Graw-Hill Book Company, New York and London, 1936, p. 549.

TABLE XIX

MEANS OF PRINCIPLE MEASURES OF STUDY CLASSIFIED ACCORDING TO SEX

Measure	Lower Division		Upper Division	
	Male	Female	Male	Female
Music preference	104	102	95	92
Music recognition	5.3	5.5	5.2	5.3
Music training	5.8	5.8	6.0	4.9
A.C.E.	107	102	107	106
Intellectual Introversion	23.5	22.9		28.5
Sociability	27.8	28.3	25.1	27.2
Masculinity-Femininity	42.2	35.7	42.3	37.4

ΠΙΝΑΚΑΣ XIX

ΚΑΤΑΝΟΜΗ ΑΝΑΠΗΡΩΝ ΚΑΤΑ ΦΥΛΟ ΚΑΙ ΗΛΙΚΙΑ ΣΕ ΟΡΙΣΜΕΝΕΣ ΠΕΡΙΟΧΕΣ ΤΗΣ ΕΛΛΑΔΟΣ

Περιοχή	Σύνολο	Άνδρες	Γυναίκες	Ποσοστό ανδρών	Ποσοστό γυναικών	Μέση ηλικία ανδρών	Μέση ηλικία γυναικών
Αστικές περιοχές	1.000.000	510.000	490.000	51,0	49,0	42,5	45,2
Μικτές περιοχές	500.000	260.000	240.000	52,0	48,0	40,2	43,5
Αγροτικές περιοχές	300.000	160.000	140.000	53,3	46,7	38,7	41,0

attained between music preference and masculinity-feminity is not significantly different from 0 and may be said to have come about through the operation of chance. A complete table of correlation for all factors in this study may be found in Table XXII. (See page 64.)

A "t" test run between the lower division and upper division in the masculinity-feminity scores revealed a "t" ratio of .237 which is not significant.

5. Intellectual Introversion. This factor yielded a correlation coefficient of .633 with music preference. This proved to be the highest correlation of any factor in the study. This would seem to indicate that the person who prefers classical music has a personality pattern which may be described as intellectually independent, analytical, and theoretical. Such an individual likes carefully planned and detailed work, is persistent at tasks, and is serious as opposed to casual.

Because of the strength of the correlation between intellectual introversion and musical preference, an analysis of variance and covariance was run between the lower division and upper division on the Music Preference Test scores holding intellectual introversion constant in order to note whether or not such an adjustment would modify the significant difference found between the means of the two groups in music preference. The null hypothesis

established between music preference and masculinity-femininity is not significantly different from 0 and may be said to have come about through the operation of chance. A complete table of correlation for all factors in this study may be found in Table XXII. (See page 64.)

A "t" test run between the lower division and upper division in the masculinity-femininity scores revealed a "t" ratio of .237 which is not significant.

5. Intellectual Interversion. This factor yielded a correlation coefficient of .613 with music preference. This proved to be the highest correlation of any factor in the study. This would seem to indicate that the person who prefers classical music has a personality pattern which may be described as intellectually independent, analytical, and theoretical. Such an individual likes carefully planned and detailed work, is persistent at tasks, and is serious as opposed to casual.

Because of the strength of the correlation between intellectual interversion and musical preference, an analysis of variance and covariance was run between the lower division and upper division on the Music Preference Test scores holding intellectual interversion constant in order to note whether or not such an adjustment would modify the significant difference found between the means of the two groups in music preference. The null hypothesis

to be tested was: there is no significant difference between the means of the two groups in the Music Preference Test scores when the factor of intellectual introversion was constant or eliminated statistically. The basic data for this analysis may be found on page 80.

Table XX (p. 60) contains this analysis of variance and covariance. The F ratio of 3.11 was lower than the tabled value of 3.91 at the 5 per cent level and was therefore not significant. The hypothesis was therefore not accepted. There was no significant difference between the means of the two groups in the Music Preference Test scores when intellectual introversion is held constant. This is an important finding. When the necessary adjustment was made for the influence of the factor of intellectual introversion, the significant difference in the means of the Music Preference Test scores between the lower division and the upper division disappeared. This implies that intellectual introversion is an important factor influencing music preference.

6. Sociability. This trait was used to give a measure of social introversion as opposed to intellectual introversion. A correlation of -.150 was revealed which was not significant. A "t" test run between the lower division and the upper division revealed a t ratio of 1.37 which was not significant

TABLE XX

ANALYSIS OF VARIANCE AND COVARIANCE OF THE MUSIC PREFERENCE TEST SCORES HOLDING INTELLECTUAL INTROVERSION CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced				
					df	S.S.	M.S.	F	Hypothesis
Within	147	46,001	4,803	-8,837	146	29,742	204		
Between	1	4,425	479	1,454	1	634	634	3.11	Accepted
Total	148	50,426	5,282	-10,291	147	30,376			

TABLE XX

ANALYSIS OF VARIANCE AND COVARIANCE OF THE MUSIC PREFERENCE TEST SCORES HOLDING INTELLECTUAL INTROVERSION CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or regressed				
					df	S.S.	M.S.	F	Hypothesis
Within	147	16,001	5,603	-3,837					
Between	1	4,145	479	1,414					
Total	148	20,146	5,082	-3,291					

7. Intelligence. Our findings concur with the findings of Gernet, Keston, Thorpe, Mohler, and others who state that there is not a strong correlation between music preference and intelligence or academic aptitude. A Pearson "r" of -.29 was found between I. Q. and music preference scores. This follows the same general trend as Gernet's correlation of .11 and Keston's correlation of -.44. A minus correlation in both the Keston study and the present one is to all intents and purposes a plus correlation since the Music Preference Test scores are based upon a scoring method such that the lower the score, the more discriminating is the person.

8. Music Recognition. Since Gernet states that the music compositions most frequently recognized were the compositions most frequently preferred, we would expect those students who had the ability to identify classical compositions to prefer classical music. This finding is borne out by our experimental evidence. A correlation of -.513 between music preference and music recognition was found. It may be mentioned again that music preference correlations in this study are negative in sign but positive in meaning due to the nature of the scoring of the Music Preference Test.

As in the case with intellectual introversion,

because of the high correlation found, an analysis of variance and covariance was run between the Music Preference Test scores of the lower division and the upper division with the factor of music recognition held constant. The basic data for this analysis may be found in page 81. of the Appendix. Table XXI (p. 63) contains this analysis of variance and covariance. The F ratio obtained is 2.08, which is lower than the tabled value of 3.91 for the 5 per cent level. The null hypothesis that there is no significant difference between the means of the Music Preference Test scores of the lower division and the upper division is therefore accepted. This is also a significant finding, since it implies that the ability to identify classical compositions is an important factor influencing preference for this type of music.

9. Correlation Data. Correlation coefficients with music preference and each factor were calculated. The basic data for this calculation may be found in page of the Appendix. All correlation coefficients in order of decreasing strength found in this study are listed in Table XXII (p. 64).

As indicated on page 56 , a correlation of .208 is necessary for a correlation coefficient to be significantly different from zero with 147 degrees of freedom. The only correlation coefficients which are not significantly from

TABLE XXI

ANALYSIS OF VARIANCE AND COVARIANCE OF MUSIC PREFERENCE TEST SCORES HOLDING THE EFFECT OF MUSIC RECOGNITION CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or reduced df	S.S.	M.S.	F	Hypothesis
Within	146	45,813	3,128	-6,481	145	32,391	233.38		
Between	1	4,569		61	1	4,856	4,856	2.084	Accepted
Total	147	50,382	3,128	-6,420	146	37,427			

TABLE XXI

ANALYSIS OF VARIANCE AND COVARIANCE OF MUSIC PREFERENCE TEST SCORES HOLDING THE EFFECT OF MUSIC EDUCATION CONSTANT

Source of Variation	df	Σy^2	Σx^2	Σxy	Adjusted or residual			
					df	S.S.	M.S.	F
Within	116	45,813	3,128	-6,191	115	35,333	213.33	
Between	1	6,309			1	1,635	1,635	7.65** Accepted
Total	117	52,122	3,128	-6,191	116	37,427		

TABLE XXII

SUMMARY OF CORRELATION COEFFICIENTS IN ORDER OF DECREASING STRENGTH

Factor	r	Conclusion
Music Preference and Intellectual Introversion	.633	Significant
Music Preference and Music Recognition	.513	Significant
Music Preference and Music Training	.410	Significant
Music Preference and Age	.378	Significant
Music Preference and Intelligence	.289	Significant
Music Preference and Social Introversion	.150	Not Signif.
Music Preference and Masculinity-Feminity	.091	Not Signif.

zero are correlations between Music Preference and Social Introversion and between Music Preference and Masculinity-Feminity. A comparison between the correlation coefficients found in this study with those found by Keston and Gernet will be found in Table XXIII (p.66).

10. Interpretation of the Questionnaire Data. The questionnaire was used in this study as a validation device as well as to obtain music training scores. Students were asked to give their reaction to classical music and swing (Figure I, page 29). A number of "t" tests were run to determine whether there were significant differences between students who differed in their reaction to classical music and swing. A summary of the Music Preference Test scores for these groups will be found in Tables XXIV, XXV, XXVI, and XXVII (pp. 67-68). The results of the "t" tests between the groups are summarized in Table XXVIII (p. 69). An inspection of this table will reveal a significant difference between the Music Preference Test scores of the students who professed to like classical music as opposed to the students who stated that they did not like classical music. It is interesting to note that this difference does not exist between students who professed to like swing as opposed to students who stated they did not like swing. This would seem to indicate that students who like classical

TABLE XXIII

A COMPARISON BETWEEN CORRELATION COEFFICIENTS FOUND IN THIS STUDY WITH THOSE FOUND BY KESTON AND GERNET

Measure	Gernet	Keston	Present Study
Music Preference and Music Training	.45	-.38*	-.41*
Music Preference and Age	.23	-.---	-.38*
Music Preference and Intelligence	.11	-.44*	-.29*
Music Preference and Music Recognition	---	-.49*	-.31*

* These correlations are negative in sign but positive in meaning.

TABLE XXIV

MUSIC PREFERENCE SCORES FOR STUDENTS WHO LIKE CLASSICAL MUSIC

Statistical Measure	Lower Division	Upper Division	L-U Com.
Range	36-126	36-124	26-126
Frequency	62	47	109
Mean	101	89	96

TABLE XXV

MUSIC PREFERENCE SCORES FOR STUDENTS WHO DO NOT LIKE OR ARE INDIFFERENT TO CLASSICAL MUSIC

Statisti al Measure	Lower Divisiom	Upper Division	L-U Com.
Range	94-119	85-146	85-146
Frequency	33	6	39
Mean	107	113	108
Standard Deviation	6.08	18.97	9.57

TABLE XXVI

MUSIC PREFERENCE SCORES FOR STUDENTS WHO LIKE SWING

Statistical Measure	Lower Division	Upper Division	L-U Com.
Range	36-126	36-146	36-146
Frequency	79	29	108
Mean	104	92	100

TABLE XXVII

MUSIC PREFERENCE SCORES FOR STUDENTS WHO DO NOT LIKE OR ARE INDIFFERENT TO SWING MUSIC

Statistical Measure	Lower Division	Upper Division	L-U Com.
Range	90-115	44-123	44-123
Frequency	16	24	40
Mean	101	87	96

TESTS OF SIGNIFICANCE OF DIFFERENCE IN MEANS OF MUSIC PREFERENCE TEST SCORES FOR THE UPPER DIVISION AND LOWER DIVISION ON INFORMATION GATHERED FROM QUESTIONNAIRE

Measure	"t" Ratio	Prob.	Concl.
Students who do vs. students who do not like classical music	3.62	.01	Signif.
Lower div. students who do vs. lower div. students who do not like classical music	2.51	.01	Signif.
Upper div. students who do vs. upper div. students who do not like classical music	2.27	.01	Signif.
Students who do vs. students who do not like swing	1.36	-	Not Sig.
Lower div students who do vs. lower div. students who do not like swing	.30	-	Not Sig.
Upper div. students who do vs. upper div. students who do not like swing	.86	-	Not Sig.

music also like swing, but students who like swing do not necessarily like classical music.

The results of this study may be summarized as follows:

1. The mean scores for the Music Preference Test for the lower division, the upper division, and the summer school section were 102, 92, and 88 respectively. The difference between the means of the lower and upper division, and the lower division and the summer school section were statistically significant.

2. Analysis of variance and covariance revealed the most important factors influencing music preference to be intellectual introversion, music recognition, and music training.

3. Intelligence and sex were found to be negligible factors influencing music preference.

4. Age was not a significant factor influencing music preference. This is in accord with the findings of Valentine who states that the adult mode of reacting to music is established at the age of thirteen or thereabouts.

5. The following correlations were found between music preference and the following factors:

intellectual introversion	.633
music recognition	.513
music training	.410
age	.378
intelligence	.289
social introversion	.150
masculinity-feminity	.091

All factors but social introversion and masculinity-feminity revealed r's which were significantly different from zero.

6. The questionnaire data revealed that college students who like classical music also like swing, but students who like swing do not necessarily like classical music.

music also like swing, but students who like swing do not necessarily like classical music.

The results of this study may be summarized as follows:

1. The mean scores for the Music Preference Test for the lower division, the upper division, and the summer school section were 102, 93, and 89 respectively. The difference between the means of the lower and upper division, and the lower division and the summer school section were statistically significant.

2. Analysis of variance and covariance revealed the most important factors influencing music preference to be intellectual interference, music recognition, and music training.

3. Intelligence and sex were found to be negligible factors influencing music preference.

4. Age was not a significant factor influencing music preference. This is in accord with the findings of Valentine who states that the adult mode of reacting to music is established at the age of thirteen or thereabouts.

5. The following correlations were found between music preference and the following factors:

Intellectual interference	.633
music recognition	.570
music training	.410
age	.373
intelligence	.080
social interference	.170
masculinity-feminity	.001

All factors but social interference and masculinity-feminity revealed r's which were significantly different from zero.

6. The questionnaire data revealed that college students who like classical music also like swing, but students who like swing do not necessarily like classical music.

7. The high correlation of Music Preference with Intellectual Introversion as opposed to the negligible correlation of Music Preference with Social Introversion would lead one to believe that other experimenters were using the wrong measure in utilizing a straight introversion scale; this is the reason their results are not highly significant. Eyenck came closest to what we are trying to get at with his "K" and "T" factor; "K" being a preference for modern, bright paintings, and "T" a preference for the more formal aspects of the matter. This tendency to think analytically, to theorize and to delve a little more deeply into things does not imply social introversion. The analytical thinker does not have to be the shy, retiring introvert. One of the important conclusions of this study would be the fact that social and intellectual introversion are basically two separate traits. Peter's description of introversion as the tendency to attend to one's own reactions and the abstraction of the formal elements from the meaningful elements closely parallels our definition of the intellectual introvert as one who does not accept uncritically the ideas of others. If other experimenters had used this as their index of introversion, their correlations would probably have been much more significant.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The question posed at the outset of this study was what factors influence music preference. In order to gather information regarding this, three groups of students were tested: (1) a lower division group, composed of freshmen and sophomores, (2) an upper division group composed of juniors and seciors, and (3) a summer session group composed of juniors, seniors, and graduate students.

The testing instruments used were the Keston Music Preference Test which gave an index of musical discrimination, and the Heston Personal Adjustment Inventory which gave a measure of social and intellectual introversion and masculinity-feminity. Additional data were collected for the lower and upper division on the following factors: music recognition, music training, intelligence, and age.

The statistical tools utilized in the analysis of the data were the analysis of variance and covariance. An analysis of variance performed on the Music Preference Test scores revealed a significant difference between the means of the lower division and the upper division groups and between the means of the lower division and the summer session groups. An analysis of covariance was then

CHAPTER IV

SUMMARY AND CONCLUSIONS

performed wherein a test of significance was made of the means of the Music Preference Test scores of the different groups after these means had been adjusted or freed from the influences of a given variable.

Pearson "r's" were obtained to reveal relationships between music preference and each of the factors. The factors having the strongest correlation with music preference were intellectual introversion, music recognition, and music training. An analysis of covariance was made on the music preference socres of the lower and upper division groups, holding each of these three factors constant. In the case of intellectual introversion and music recognition, the significant difference between the means of the music preference scores for the lower and upper division disappeared. In the case of music training the significant difference between the scores was reduced to the region of doubt. This indicates that intellectual introversion, music recognition, and music training were the most important factors influencing music preference.

BIBLIOGRAPHY

BIBLIOGRAPHY

A. BOOKS

Fisher, Ronald A., and Frank Yates, Statistical Tables. London and Edinburgh; Oliver and Boyd, Ltd., 1946.

Gernat, Sterling, Musical Discrimination at Various Age and Grade Levels. College Place, Washington; The College Press, 1940.

Guilford, J.P., Psychometric Methods. New York; McGraw-Hill Book Co., 1936.

Lazarfeld, P.F., Radio and the Printed Page. New York; Duell, Sloane, and Pearce., 1940.

B. PERIODICAL ARTICLES

Adler, M.J., "Music Appreciation; An Experimental Approach to its Measurement." Archives of Psychology, v. 17; 110, 1929, pp. 69-83.

Burt, C., "Correlations Between Persons," British Journal of Psychology, v. 28, pp. 50-96.

Carrol, H.A., "A Preliminary Report on the Study of the Relationship Between Ability in Art and Certain Personality Traits," School and Society, 36, 1932.

Coggins, K., Hensley and Mull, "Introversion and the Appreciation of Literature," American Journal of Psychology, 55, 1942, pp. 560-561.

Eysenck, J., "Types--Factors in Esthetic Judgment," British Journal of Psychology, 31, 1941, pp. 262-270.

Fay, Paul J., and Warren C. Middleton, "Relationship Between Musical Talent and Preference for Different Types of Music," Journal of Educational Psychology, 32, 1941.

Jones, A., and Nemzek, C., "Children's Interest in Music," School Music, Nov.-Dec., 1933, p. 6.

BIBLIOGRAPHY

A. BOOKS

Fisher, Ronald A., and Frank Yates, *Statistical Tables*. London and Edinburgh: Oliver and Boyd, Ltd., 1940.

Gernet, Sterling, *Musical Discrimination at Various Age and Grade Levels*. College Place, Washington: The College Press, 1940.

Guilford, J.P., *Psychometric Methods*. New York: McGraw-Hill Book Co., 1936.

Lazarsfeld, P.F., *Radio and the Printed Page*. New York: Duell, Sloane, and Pearce., 1940.

B. PERIODICAL ARTICLES

Adler, M.J., "Music Appreciation: An Experimental Approach to Its Measurement." *Archives of Psychology*, v. 17, 110, 1929, pp. [illegible].

Burt, C., "Correlations Between Persons," *British Journal of Psychology*, v. 28, pp. 59-96.

Carrol, H.A., "A Preliminary Report on the Study of the Relationship Between Ability in Art and Certain Personality Traits," *School and Society*, 36, 1932.

Coggins, H., Hensley and Hill, "Introversion and the Appreciation of Literature," *American Journal of Psychology*, 55, 1942, pp. [illegible].

Eysenck, H., "Types—Factors in Aesthetic Judgment," *British Journal of Psychology*, 31, 1941, pp. 262-270.

Fay, Paul J., and Warren C. Middleton, "Relationship Between Musical Talent and Preference for Different Types of Music," *Journal of Educational Psychology*, 32, 1941.

Jones, A., and Hanzak, C., "Children's Interest in Music," *School Music*, Nov.-Dec., 1933, p. 6.

Kerr, W.A., "Three Studies in Plant Music," Industrial Music News, 1, 1943.

Myers, Charles S., "Individual Differences in Listening to Music," Journal of Educational Psychology, 17, 1936.

Peters, Henry N., "The Experimental Study of Esthetic Judgment," Psychological Bulletin, 31, 1942.

Schultz, E.J., "Testing Listening Power in Music," Music Educator's National Conference Yearbook, 1933, pp. 306.

Sisson, E.D., and B. Sisson, "Introversion and the Esthetic Attitude," Journal of Genetic Psychology, 22, 1940, pp. 303-308.

Trabue, M.R., "Scales for Measuring Judgment of Orchestral Music," Journal of Educational Psychology, 14, 1933, pp. 545-561.

Thorpe, Louis P., "The Orchestral Type Preference of Students," Journal of Applied Psychology, 1936, pp. 778-782.

C. UNPUBLISHED MATERIAL

Keston, Morton J., "An Experimental Evaluation of the Efficacy of Two Methods of Teaching Music Appreciation," Unpublished Doctor's Dissertation, The University of Minnesota, Minneapolis, 1949.

D. MANUALS AND MISCELLANEOUS

National Survey of Public Interest in Music, American Music Conference, 1946.

Heston, Joseph C., Manual of Directions for the Heston Personal Adjustment Inventory. New York: World Book Co., 1949.

APPENDIX

SUMMARY DATA FOR PRINCIPAL MEASURES OF THE STUDY FOR UPPER AND LOWER DIVISIONS COMBINED

Stat. Measure	M.P.	M.R.	M.T.	A.C.E.	I.I.	S.I.	M-F	AGE
Range	36-146	0-26	1-15	52-163	9-40	6-41	19-54	17-44
Frequency	150	148	54	132	148	148	148	139
Mean	99	5	5.5	105	25	27	40	22.9
Standard Dev.	18.36	4.58	3.46	19.89	5.94	7.61	7.81	5.1

M.P. = Music Preference
M.R. = Music Recognition
M.T. = Music Training
A.C.E. = Intelligence
I.I. = Intellectual Introversion
S.I. = Social Introversion
M.F = Masculinity-Femininity

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES FOR THE ANALYSIS OF VARIANCE AND COVARIANCE BETWEEN THE LOWER DIVISION GROUP AND THE SUMMER SESSION GROUP HOLDING AGE CONSTANT

Group	N	ΣX	Raw Scores ΣX²	ΣY	ΣY²	ΣXY
Lower	92	1992	44,063	9496	992,399	202,734
Summer Ses.	51	1532	50,172	4452	438,435	132,155
Σ	143	3523	94,235	13,948	1,430,884	334,889

	N	Σx	Deviation Scores Σy²	Σxy
Lower	92	975	12,247	-2772
Summer Ses.	51	4152	49,852	-1579
Σ	143	5127	62,099	-4351
Total	143	7441	74,804	-8739

X= Age
Y= Music Preference Sc.

SUMS, SUMS OFSSQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES FOR ANALYSIS OF VARIANCE AND COVARIANCE BETWEEN THE UPPER DIVISION AND SUMMER SCHOOL HOLDING AGE CONSTANT

Raw Scores

	N	ΣX	ΣX²	ΣY	ΣY²	ΣXY
Upper Div.	49	1234	32,553	4637	466,137	120,528
Sum.Sess.	51	1532	50,172	4452	438,435	132,155
Σ	100	2766	82,725	9089	904,572	252,683

Deviation Scores

	Σx	Σy	Σxy
Upper Div.	1627	12,247	-2772
Sum.Sess.	4152	49,852	-1579
Σ	5779	62,099	-4351

X = Age
Y = Music Preference Scores

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES
FOR ANALYSIS OF VARIANCE AND COVARIANCE
HOLDING INTEELECTUAL INTROVERSION
CONSTANT

Raw Scores

	N	ΣX	ΣX²	ΣY	ΣY²	ΣXY
Lower Div.	95	2211	55,309	9803	1,023,914	225,748
Upper Div.	54	1458	40,318	4960	489,238	127,487
Σ	149	3669	95,627	14763	1,513,152	353,235

Deviation Scores

	Σx	Σy	Σxy
LowerDDiv.	3851	12,348	-2404
Upper Div.	952	33,653	-6433
Σ	4803	46,001	-8837
Total	5282	50,426	-10291

X = Intellectu al Introversion
Y = Music Preference

SUMS, SUMS OF SQUARES, SUMS OF CROSS PRODUCTS, AND DEVIATION SCORES
FOR ANALYSIS OF VARIANCE AND COVARIANCE
HOLDING MUSIC RECOGNITION CONSTANT

	N	Raw Scores ΣX	ΣX²	ΣY	ΣY²	ΣXY
Lower Div.	93	503	4969	9606	1,004,365	48,227
Upper Div.	55	289	2397	5049	497,159	23,777
Σ	148	792	7366	14655	1,501,524	72,004

	N	Deviation Scores Σx	Σy	Σxy
Lower Div.	93	2249	12,158	-3728
Upper Div.	55	879	33,661	-2753
Σ	148	3128	45,819	-6481
Total	148	3128	50,382	-6420

X= Music Recognition Scores
Y= Music Preference Scores

CORRELATION DATA FOR MUSIC PREFERENCE TEST AND OTHER FUNCTIONS

Factor	X	Y	X^2	Y^2	XY	r*	Significance
MPT-M-F	14,763	5,934	1,513,152	244,975	589,980	.097	Not Significant
MPT-S.I.	14,763	4,024	1,513,152	117,790	395,503	-.150	Not Significant
MPT-I.I.	14,763	3,669	1,513,152	95,627	353,235	-.633	Significant
MPT-M.R.	14,666	792	1,504,137	7,373	72,004	-.513	Significant
MPT-A.C.E.	13,161	13,944	1,356,356	1,525,255	1,376,453	-.289	Significant
MPT-M.T.	5,084	300	499,043	2,356	25,995	-.410	Significant
MPT-Age	14,133	3,292	1,453,302	77,492	324,207	-.378	Significant
M.R.-A.C.E.	722	13,944	7,108	1,525,255	79,963	-.288	Significant

MPT= Music Preference Test
M-F= Masculinity-Femininity
S.I.= Social Introversion
I.I.= Intellectual Introversion
M.R.= Music Recognition
M.T.= Music Training

*Negative Correlations are negative in sign but positive in meaning.

IMPORTANT!

Special care should be taken to prevent loss or damage of this volume. If lost or damaged, it must be paid for at the current rate of typing.