

COMPARING THE VOCATIONAL INTERESTS OF ARTS AND SCIENCE FRESHMEN USING THE STRONG-CAMPBELL INTEREST INVENTORY

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Abstract

This study compares the vocational interests of University of Ottawa Arts and Science freshmen in terms of their Basic Interest scale scores on the Strong-Campbell Interest Inventory. Six discriminant function analyses were made using two groups at a time. A four-group discriminant analysis was conducted between Arts males, Science males, Arts females, and Science females. In each stepwise analysis, significant differences in Basic Interests were found between Arts and Science freshmen as well as between sexes within these curricula. Prediction into group membership on the basis of the discriminant scores yielded more correct classifications than expected by prior group size probability.

Résumé

Cette étude s'est donnée pour objectif de connaître les intérêts vocationnels des étudiants de première année inscrits aux facultés des Arts et des Sciences, et plus spécifiquement, connaître leurs profils d'intérêts de base par le truchement du test "Strong-Campbell Interest Inventory". Six analyses discriminantes ont été utilisées pour la comparaison des groupes, deux groupes à la fois. Également, une analyse discriminante à quatre groupes fut effectuée afin de comparer les hommes inscrits aux Arts, les hommes inscrits aux Sciences, les femmes inscrites aux Arts, et les femmes inscrites aux Sciences. Dans chaque analyse à plusieurs étapes, on a trouvé des différences significatives entre les intérêts de base des étudiants inscrits aux Arts et des étudiants inscrits aux Sciences, de même qu'entre les intérêts de base des deux sexes pour chacun de ces curricula. Cette prédiction de groupe basée sur les scores discriminants a révélé des classifications encore plus exactes que prévues par hasard compte tenu de la grandeur du groupe.

Studies by Strong (1943, 1955), McArthur (1954), and Berdie (1955) have shown the extent to which the scores of college students are related to their occupations as adults. These studies support the use of the Strong Vocational Interest Blank (SVIB) for counselling students who are planning studies in preparation for later careers. Layton (1958) suggested using the SVIB in aiding students with their selection of a particular college major. Dunteman (1966) also gave broad endorsement for the use of the SVIB in educational-counselling situations. The usefulness of such an instrument for counselling university students necessitates a wide range of research to differentiate the interests of specific groups within the university population.

The variables which determine the choice of an academic major are extremely complex. There is some evidence that individuals within certain college

majors have similar psychological characteristics (Sternberg, 1959). In differentiating between the interests of freshmen majoring in engineering and the physical sciences, Korn (1962) concluded that we should describe the interests of students within majors in terms of which interests are shared as well as which are absent. Using multiple discriminant function analysis, Dunteman (1966) was able to successfully distinguish between groups of women majoring in Occupational Therapy, Medical Technology, Physical Therapy, Nursing, and Education. He found that 29 SVIB scales for women differentiated the groups from each other. On the basis of only 11 scales, successful discrimination was still possible ($p < .001$), accounting for approximately 92% of the variation among groups.

The present study compared the Basic Interest scores of Arts and Science freshmen as obtained from

the Strong-Campbell Interest Inventory (SCII). The aim of the study was to focus on: the degree of discrimination made between groups in terms of the Wilks' Lambda (Cooley & Lohnes, 1962); the contribution of each Basic Interest scale to the final discrimination in terms of discriminant-function coefficients; the centroids of the function or functions for each group in reduced space; and the accuracy of the discriminant-function scores to classify individuals as members of the specified groups in terms of the percentage of "grouped" cases correctly classified.

METHOD

Sample

A total of 371 Arts and Science freshmen were tested at the University of Ottawa. Eleven subjects were eliminated because of improperly completed forms. Of the remaining 360 subjects, 202 were male and 158 female. The Arts group consisted of 154 subjects (54 male and 101 female). In the Science group, 206 subjects were tested (149 male and 57 female). Subjects were selected on the basis of being registered in compulsory courses for their major.

Instruments

The measuring instrument used in this study was the Strong-Campbell Interest Inventory (Campbell, 1974). The SCII questionnaire lists 325 items, requiring the response like, indifferent, or dislike on the answer sheet. These items are divided into seven sections in the test booklet.

The results of the inventory are presented to the subject in a profile on three dimensions: General Occupational Themes, Basic Interest Scales, and the Occupational Scales.

The Basic Interest Scales, with which the present study is concerned, provide a picture of how the subject groups his interests in terms of 'likes' and 'dislikes' to form 23 homogeneous scales. The specific details of the construction of these scales are given in the *Handbook for the SVIB* (Campbell, 1971). The *SCII Handbook* (Campbell, 1974) lists numerous studies supporting the predictive validity of the Basic Interest Scales. Test-retest reliabilities for the SCII are slightly higher than those of the SVIB scales (Johansson, 1974, p. 41).

Research Design

Tests were administered to nine classes within the faculties of Arts and Science at the University of Ottawa. The completed SCII answer sheets were scored by National Computer Systems in Minneapolis. The scoring agency provided the raw scores

for each subject as well as the standard score profiled results.

The discriminant-function analysis method was chosen on the basis of being the technique most suitable to test the hypotheses of this study. Each analysis was aimed at finding the best combination of Basic Interest scales to discriminate between the specified groups.

The data were examined in terms of the raw scores obtained by each subject on the 23 Basic Interest scales of the SCII.

Hypotheses

It was hypothesized that there would be a significant difference between the Basic Interests of Arts and Science freshmen. Further, it was hypothesized that there would be significant differences on patterns of Basic Interests between: males and females; Arts males and Arts females; Science males and Science females; Arts males and Science males; Arts females and Science females. All hypotheses were tested at $p < .01$.

The results of each analysis provided support for the acceptance of each of the hypotheses. The discriminating power of the functions was tested by chi-square approximations with $p(k-1)$ degrees of freedom, where p is the number of variables and k is the number of groups. A four-group analysis between Arts males-Science males-Arts females-Science females provided a chi-square of 489.08 which was significant at $p < .01$ on the first function and 154.51 on the second (also significant at $p < .01$). Thus, Arts and Science freshmen were found to have significantly different interests, as were males and females within these groups. Figure 1 presents the raw scores for each group on the 23 Basic Interest scales.

A four-group discriminant analysis of the data indicated that these Basic Interest differences were manifesting themselves in high and low scores on two discriminant functions. The first function contributed 75.28% to the differentiation whereas the second provided 21.85% of the information for discriminating between the groups. The distribution of group centroids in the discriminant function space is shown in Figure 2.

The prediction into group membership of the basis of discriminant scores yielded 90.6% correct classifications for Science males, 79.2% for Arts females, 50.9% for Science females, and 43.4% for Arts males. Taking into account that subject assignment to groups was not random, but dependent upon the faculty in which each student was enrolled, the proposed classification via discriminant analysis

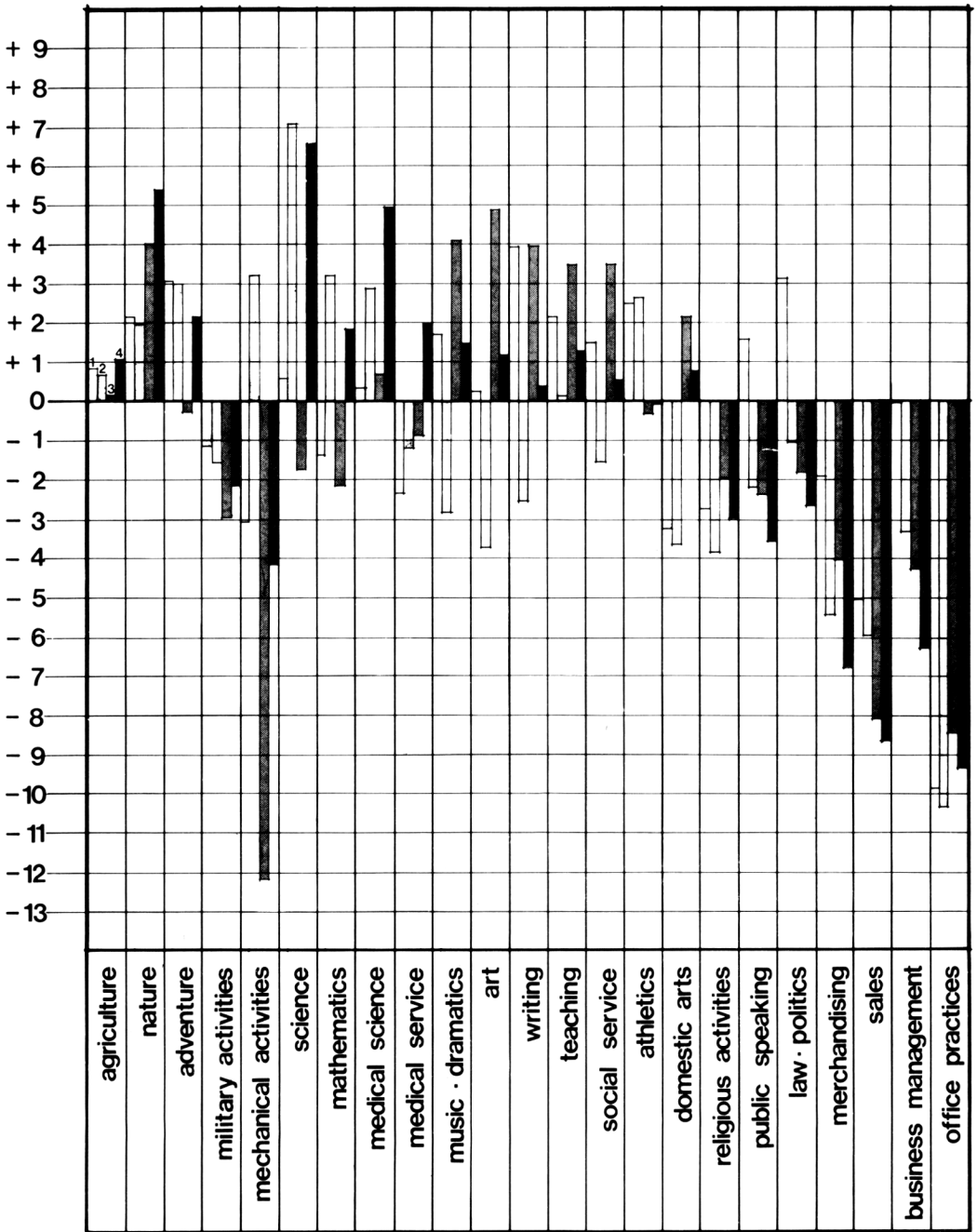


FIGURE 1. BASIC INTEREST SCALE · raw scores ·

legend

- 1 arts males (n=53)
- 2 science males (n=149)
- 3 arts females (n=101)
- 4 science females (n=57)

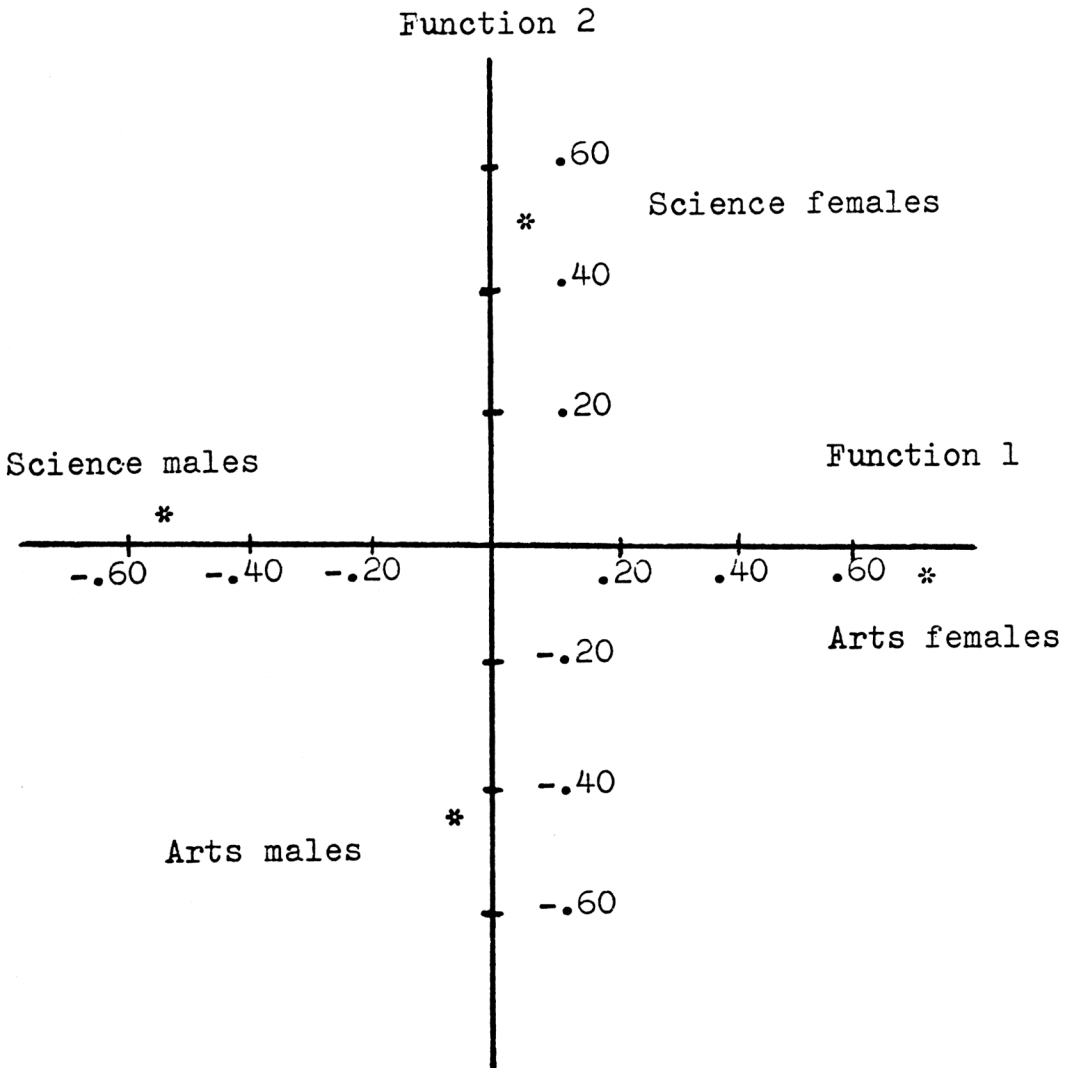


Figure 2. Basic Interest Scales: Group centroids in the discriminant function space for the Arts males, Science males, Arts females, Science females discrimination.

appeared superior to the above system of assignment to groups in all cases.

DISCUSSION

On the basis of the above analyses, Basic Interest was found to be a significant factor in differentiating between Arts and Science students and the sexes within these curricula. Among the 23 items, certain scales provided more information than others for the discriminant function(s). In turn, some of these scales made positive contributions while others provided negative weightings for the discrimination. However,

it is the relative strength of these preferences which distinguished the groups from each other. Figure 2 indicates that Science males scored low and Arts females scored high on function 1. Conversely, Arts males scored low and Science females scored high on function 2. It was found that the Domestic Arts, Merchandising, Law/Politics, and Social Service scales have the highest positive weights for determining the discriminant scores on function 1. On the other hand, Sales, Public Speaking, Science and Mechanical Activities have the highest negative weights on this function. This dimension was

interpreted as representing "people-oriented" versus "task-oriented" interests. Here, the scales having positive weights seem to indicate more of an interest in helping others while those with negative weights indicate interests of a less individually supportive nature and which require working alone more than with others.

The second discriminant function is defined by positive weights on Domestic Arts, Mathematics, Medical Science, and Medical Service, and by negative weights on Merchandising, Public Speaking, Athletics, and Teaching scales. The scales with the highest positive loadings seem to involve professions that are relatively "structured" and "technical" while the scales with the highest negative loadings seem to define professions that are "less structured" and "less technical" in orientation.

In interpreting these findings, it may be hypothesized that the strength of these Basic Interest differences may be one of the underlying motivators for choosing one curriculum rather than another. This supports Korn's (1962) notion that a student may choose a major based on patterns of perceived interest similarities and dissimilarities with reference to that and other groups. The utility of discriminant-function analysis in such a situation is that it provides an opportunity for the individual to consider which group his interests most closely resemble.

The findings of sex differences within a given curriculum have notable ramifications for individual counselling. As males and females within a given faculty were shown to have significantly different Basic Interests, the counsellor must take this into account when making curricular assessments and advising counselees on educational decisions.

These results are particularly relevant in the context of recent studies suggesting that the sexes should be assessed on basically the same criterion for vocational-educational counselling purposes (Johansson & Harmon, 1972; Darley & Hagenah, 1955; Schlossberg & Goodman, 1972). The Strong-Campbell Interest Inventory, in answer to the dilemma, has a combined form which accommodates individuals who wish to compare their interests with people in the same as well as opposite sex.

The fact that prediction ranged from 43.4% for Arts males to 90.6% for Science males (267 correct classifications out of 360), testifies to the validity of the Strong-Campbell for counselling purposes and exemplifies the usefulness of discriminant-function analysis in doing so.

In conclusion, while discriminating scales were established for the faculties of Arts and Science,

replication of the results is a necessary step towards the eventual cross-validation of the scores to predict faculty choice. The authors note that this study was confined to a University of Ottawa sample. While it is hoped that such a sample is typical of Canadian university students, the authors recommend caution in generalizing from it. Further research is a necessary step towards providing a Faculty-discriminating profile which would be a valuable instrument for counselling purposes.

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