C H A P T E R IX

RESULTS AND DISCUSSION

The results of the investigation would be reported in the present chapter under the following sections:

(a) Preliminary observations on the central tendencies and deviations

(b) Factor Analysis

(c) Analysis of Variance.

(a) Preliminary Observations on the Central Tendencies and Deviations

In any investigation the study of the distribution, central tendencies and standard deviations forms an important part, as they reflect the nature of sampling as well as the efficacy of the tests used. It has been assumed that it is possible to identify various types of interest and discover their basic patterns. In the hope that this would be brought out by means of suitable tests, a number of devices has been evolved keeping the apriori classification in view.

The study of the ranges of interest scores derived from the entire test-battery reveals that

interests vary from group to group and even within groups. The same group may have various ranges of scores in various areas of interest and this is evidenced from table IV in Appendix B, For example, the Fine Arts group has a wider range of interest, viz., 18.4 - 43.6 than in other areas of interest. The same group has a very narrow range of interest, viz., 3.2 - 17.8 in Commerce interest. This fact indicates that a group may have varying degrees of interest in areas which are not identical. In other words, it suggests that a line of demarcation exists between one area of interest and the other. Similar observations are possible from the study of the ranges of interest obtained by other groups.

There is a considerable difference between the means obtained by various groups in the same area or between means obtained by the same group in various interest areas. For example, the range of means in Fine Arts interest varies from 9.50 - 32.76. The following table shows the range of variations in respect of means and standard deviations.

Interest	Range of the Mean	S. D. Range
Fine Arts	9.50 - 32.76	3.24 - 5.34
Technical	9.88 - 29.91	2.96 - 6.30
Commerce	11.02 - 30.10	3.14 - 5.12
Agriculture	10.57 - 33.78	3.15 - 6.32
Humanities	12.44 - 27.52	3.44 - 5.22
Science	11.60 - 27.76	3.50 - 5.72

It is also interesting to observe that the standard deviations of the interest scores in the respective field of interest obtained by the particular group is in general higher than those obtained by other groups in the same area of interest.

(b) Factor Analysis

As reported by Verma (1), "Factor analysis according to Thurstone, assumes that a variety of phenomena within a domain are related and that they are determined, at least in part by relatively small number of functional unities or factors".

1 Verma, M.: An Introduction to Educational and Psychological Research, Asia Publishing House, 1965, p. 110.

Factor analysis begins with the intercorrelations of a number of tests. The study of the intercorrelations may help one to observe the surface sign and trends of the phenomena of a domain which is uncovered and identified by factor analysis. It is observed from table VI in Appendix B presenting intercorrelations that there exists a positive relationship between Fine Arts interest scores and those in Humanities. Similarly, there exists a positive correlation between Technical and Science. As regards the correlation between Commerce and the rest, the picture is rather inconsistent and same is the case between Agriculture and the rest. With a view to exploring further, factor analysis as suggested by Hotelling(2) has been carried out.

What is generally followed is to tabulate the intercorrelations between those variables and form a composite correlation matrix with the diagonal cells filled up in a particular way. Of all the possible methods of factor analysis, the centroid method is the simplest as well as quite useful for the purpose of reducing the variables into a few. The advantage of

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2 Hotelling, H; "Analysis of a Complex of Statistical Variables into Principal Components", J. of Educ. Psychol., 24, (1933a), 417-441 and 498-520.

this factor analysis is obvious as it permits the investigator to study the contribution of each factor to the total variance, and to determine the loading of each factor on each variable. The application of factor analysis is also helpful in discovering a relatively small-er number of functional unities or factors. It enables the investigator to uncover and identify the factors underlying the relationship between different variables. What matters is not the relationship of one single variable with another but the intercorrelationships among many variables and their interactions with one another. Thus, factor analysis as a technique has proved its value in discovering the basic patterns or factors out of a number of interrelationships. In the present investigation, centroid analysis has been tried for finding out whether all the subtests are measuring the same factor of interest. This method is considered adequate for factor analysis as it permits an exploratory approach to the factorial content of tests. One of the problems in factor analysis is the identification of factors and testing their significance. It is indeed difficult to interpret the factor loadings on a number of variables as interpretation tends to be subjective.

In the present investigation 'principal axes

factor analysis using Hotelling's iterative procedure' has been applied with a view to testing how far the apriori classification of interest is justifiable . It is expected that the result of the factor analysis would throw sufficient light on the patterns of interest.

Correlation matrices have been prepared for different groups in the hope that the intercorrelations between the assumed areas of interest would reflect the fundamental interest patterns. It is quite likely that the classifications so far made are guided by various considerations including sociological ones. Factor analysis has been attempted on the basis of the inter-correlations between interest scores in six areas of interest for each group, for the purpose of finding out a clear-cut picture in each case. This has proved helpful in observing the variations from group to group and accounting for them before generalizations.

The following table presents the first factor loadings emerging out of the factorial analysis.

First Factor Loadings

Interests	Groups					
	F	T	C	A	H	Sc
F	-.578	-.436	.610	-.398	.428	.603
T	.758	.813	-.595	.688	.682	-.568
C	.509	-.491	-.529	.168	-.620	.719
A	.649	-.372	-.189	-.328	.421	.057
H	.209	-.652	.735	-.512	.550	.506
Sc	.683	.414	-.349	.770	.605	-.640

It is observed from the above table that the first factor loadings vary from group to group, although it is not difficult to discover a consistent picture inspite of the variations. If we concentrate on the factor-loadings derived from Fine Arts group, it would be seen that all loadings are positive except that on Fine Arts. Negative loadings on Fine Arts interest have also appeared on Technical and Agriculture groups besides Fine Arts. It is also striking that in Fine Arts group the first factor loadings are positive and extremely high on Technical, Agriculture and Science, It is likely that these three areas might form a cluster. When we observe the factor loadings from the Technical group the picture is partly confirmed by

the fact that both the Technical and Science interest have got positive loadings and the remaining negative. It is also interesting to have a look at the loadings from the Commerce group where it would be seen that Fine Arts and Humanities interest have positive and high loadings while Technical, Science, Commerce and Agriculture have negative ones. In Agriculture and Humanities groups also, one can observe the dominance of the loadings on Technical and Science. Similarly, in the Science group the loadings on Technical and Science although negative are considerably high.

In short, the first factor looks like the one which is saturated with practical bias and may be identified as scientific interest. This may be identified as "practical interest" as opposed to aesthetic or ideational interest.

Second Factor Loadings

Interests	Groups					
	F	T	C	A	H	Sc
F	.496	.735	-.360	-.638	-.648	.246
T	-.167	-.143	-.543	-.154	.421	.568
C	-.353	-.513	.726	-.608	.523	.360
A	.503	-.515	-.567	.738	.770	.721
H	.814	-.182	.064	-.273	-.238	-.408
Sc	.133	-.319	-.346	.082	.191	-.119

On a study of the loadings for each group, one can hardly miss that there is a clear dichotomy of interests reflected through the factor loadings for each group. The loadings in the Fine Arts group are positive and quite high on Fine Arts, Agricultural and Humanities where as those in other groups present a confusing picture. In the Technical group the loadings on Commerce and Agriculture are negative and quite high although the dichotomy is maintained. In Commerce group, however, the loadings on Technical and Agricultural interests are negative and very high bespeaking some overlap between the two. The factor loadings in Agriculture group are rather misleading as the only positive loading is extremely high on Agriculture while the negative loadings are high on Fine Arts and Commerce. In Humanities group, however, the picture is more meaningful as both the negative loadings are on Fine Arts and Humanities while the positive ones are on Technical, Agricultural and Science. From the Science group, it is observed that both the Technical and Agriculture interests have positive and high loadings indicating again a possible overlap between them. Inspite of the dichotomy, the second factor reflecting the Fine Arts group looks like one saturated with "ideational" or "theoretical" interest.

In other groups like Technical and Science the positive loadings of this factor on Fine Arts tends to confirm the fact that there may be a basic dimension of interest related to creativity. Thus, in some of the groups the similar loadings on Humanities and even Agriculture indicate something in common between Fine Arts, Humanities, and even Agriculture. This also points out the superficiality of most of the classifications of interest.

Third Factor Loading

Interests	Groups					
	F	T	C	A	H	Sc
F	-.233	.191	.018	-.226	-.522	.015
T	-.393	-.370	.055	-.276	-.341	-.118
C	.587	.430	-.072	.616	-.353	-.042
A	.283	-.308	-.613	.079	.298	.543
H	.230	-.352	.185	-.569	.653	.603
Sc	-.538	.608	.771	-.349	-.410	.599

It is observed that some of the loadings are very high on certain areas so far as the Fine Arts group is concerned. The loadings of +.587 on Commerce interest, +.238 on Agriculture and +.230 on Humanities suggests that there exists an interest pattern

demanding manipulation through various activities. In other two groups, viz., Technical and Agriculture, the positive and at the same time high factor loadings of +.430 and +.616 respectively on Commerce interest might indicate that this third factor may be identified as an interest related to Commerce and computative.

Fourth Factor Loading

Interests	Groups					
	F	T	C	A	H	Sc
F	.510	.324	.615	-.353	-.240	.757
T	-.252	-.038	.213	.469	-.399	.040
C	.413	-.439	.081	.369	.016	-.323
A	.169	.570	-.409	.305	-.132	-.155
H	-.348	.062	-.490	.488	.080	-.111
Sc	.349	.505	-.223	-.227	.656	.215

From the above table, it is observed that the picture is too inconsistent to permit any generalization and identification. In some groups the loadings confirmed the previous findings while in a few groups it is difficult to bring out a meaningful picture. The dichotomy is of course, reflected without much consistency.

An overall view is thus, a necessity in the midst of confusions presented by the results of the factor analysis. It is likely that the basic assumption underlying the classification of the interest areas, suffers from limitations owing to preconceived notions. Inspite of the fact that there exists a number of interest areas, the inconsistencies in the factor loadings reflect a considerable overlap between them. Besides, the classifications on the basis of which the tests have been constructed might not be in full harmony with the fundamental units or dimensions of interest. It is likely that our classification has been mainly guided by the sociological considerations or some other practical purposes. But reality is different. Thus, it may be necessary to go for more fundamental classifications like creative-ideational, practical-scientific and manipulative-computational, instead of the classifications which appear to be conventional.

In the present investigation it might be conjectured that our postulates are not entirely out of the way although a terrible overlap between a few areas of interest has been observed. Some of the interests assumed in the investigation tend to form a cluster thereby reducing the number of basic dimensions into three instead of six.

(c) Analysis of Variance

The importance of environmental factors in the present investigation is obvious because of the hypotheses already formulated. The main objective of this research is to relate the interest patterns to the environmental factors. As such, it has been a necessity to collect environmental data under certain categories and tabulate respective interest scores in respective cells under 1 x 1 factorial design. As mentioned earlier, it is very often a problem to get a sample distributed in equal proportion in all the cells. There remains no other choice but to treat the data as they are, in the hope that the analysis would bring out the general trends and their implications. Qualitative data have been collected around a few environmental categories for the purpose of delimiting the scope of the investigation. It is, however, a formidable task to quantity environmental data because of the inherent difficulty in measuring environment in all its dimensions.

It is also not practical to treat the entire data simultaneously under one operation taking into account all the environmental factors together for finding out the main effect of each and corresponding interaction as that would make the design unweildy. This is why the analysis of variance has been carried out taking on:

only two variables at a time and adopting 1 x 1 factorial design. This would permit the investigator to take into account all the possible interactions and find the main effect of each variable on various interests.

Interest	Main effect		Interaction
	V_1 (F.O.)	V_2 (Area)	
Fine Arts	3.14 *	1.55	1.26
Technical	2.41 *	2.88 *	1.43
Commerce	2.71 *	3.29	1.16
Agriculture	10.01 *	11.73 *	0.87
Humanities	1.64	4.01 *	1.82
Science	1.16	0.96	1.41

* Marked items having significant F-values.

It would be observed from table 1, that the main effect of the same variable varies from one area to another area of interest. For example, the effect of father's occupation as a variable is significant in four areas of interest, viz., Fine Arts, Technical, Commerce and Agriculture. Similarly, it would be observed from the table that the main effect of area of residence has come out significant with combinations with F.O. (father's occupation) on Technical, Commerce, Agriculture and Humanities interest.

Interest	Main effect		Interaction
	V_1 (F.O.)	V_2 (F.T.)	
Fine Arts	2.06	3.18 *	1.10
Technical	1.02	6.28 *	0.79
Commerce	0.90	2.23	0.78
Agriculture	5.96 *	11.17 *	1.01
Humanities	1.06	0.62	1.01
Science	1.35	1.53	0.61

As regards the main effect of family tradition in combination with F.O. the above table shows the family tradition has come out significant in Fine Arts, Technical and Agricultural interest, whereas its effect on Commerce interest is on the boarder-line of significance.

Interest	Main effect		Interaction
	V_1 (F. O.)	V_2 (P.D.)	
Fine Arts	1.45	49.91 *	1.46
Technical	1.96	38.72 *	0.95
Commerce	1.83	42.58 *	0.62
Agriculture	6.19 *	58.94 *	1.26
Humanities	0.68	26.02 *	1.36
Science	1.58	20.78 *	1.04

Regarding the main effect of P.D. (Parental desire) it would be found that its effect is coming out significant in all the areas of interest in combination with F.O. In the case of stream as a variable its main effect on each area of interest is quite significant as will be observed from the table below:

Interest	Main effect		Interaction
	V_1 (F.O.)	V_2(Stream)	
Fine Arts	1.30	21.30 *	0.78
Commerce	1.40	12.06 *	1.27
Science	1.25	1.00	1.00

As regards the main effect of consideration as a variable it has been found to be significant in Fine Arts and Commerce interest from the table below:

Interest	Considerations
Fine Arts	4.02 *
Commerce	2.64 *
Science	1.4

It would be also interesting to observe the degree of interaction between the environmental variables.

With a view to finding out the respective interaction of each variable with another, all sorts of combination have been taken into account for analysis of variance. The following table also presents interaction between the variables:

Interest	Main effect		Interaction
	V_1 (Area)	V_2 (F.T.)	
Fine Arts	0.89	5.35 *	1.24
Commerce	2.99	1.37	1.30
Science	1.42	2.13	1.17
	V_1 (Area)	V_2 (P.D.)	
Fine Arts	2.45 *	48.52 *	1.18
Commerce	6.18 *	40.22 *	1.06
Science	1.24	20.58 *	1.31
	V_1 (Area)	V_2(Stream)	
Fine Arts	0.76	154.73 *	0.95
Technical	1.42	96.88 *	1.01
Commerce	0.30	170.22 *	1.46
Agriculture	1.68	172.57 *	1.35
Humanities	1.83	67.71 *	0.74
Science	0.49	68.90 *	1.03
	V_1 (F.T.)	V_2 (P.D.)	
Fine Arts	3.02 *	51.53 *	1.23
Commerce	0.65	44.63 *	1.70 *
Science	0.75	9.80 *	1.09

Interest	Main effect		Interaction
	V_1 (F.T.)	V_2(Stream)	
Fine Arts	1.72	23.77 *	0.83
Commerce	1.62	11.79 *	1.23
Science	1.24	14.00 *	0.62
	V_1 (P.D.)	V_2 (Stream)	
Fine Arts	0.56	23.64 *	1.05
Commerce	1.12	12.25 *	1.68 *
Science	1.60	14.92 *	0.60

From the above table, it would be observed that interaction between F.O. and Area is significant in Humanities interest. From the above table it would be found that the interaction between F.T. x P.D. is significant in Commerce interest. In case of interaction between P.D. x Stream the interaction is coming out significant in Commerce interest as well.

In this connection, it should be mentioned that the main effects vary from combination to combination as would be seen from tables given in the Appendix B. The reasons of these variations are not far to seek. It will not be out of place also to mention that in certain cases of interaction all the interest areas have not

been taken into account because the result of the factor analysis did not, however, encouraged the inclusion of all these interest areas as such for minor statistical operations.

Discussion

In the present investigation the primary task was to approach the problem of classification of interest with an open mind and also reflect upon the forces shaping interest. It has been experienced that interest takes its shape in course of interaction with environment. Thus, a large number of determinants of interest may interplay until a distinct and crystallized form of interest is manifest. It is not surprising that there would be a lot of conflicts of values in an unstable socio-economic set-up. Sociological forces very often guide the formation of values in the young mind. It was, therefore, one of the considerations behind the formulation of hypotheses in the present investigation. It must be admitted that the findings of the present investigation open up new chapters for further exploration as some of the results require confirmation with a different design. For example, there are many variables which influence the interest development. But the scope of the present enquiry did not necessitate probing into the complex process underlying the development of interest.

As mentioned elsewhere, the delicate question of chance stimulation requires a careful handling for a complete understanding of how interest develops. It might be that the same force may not prove equally effective in processing one's interest. It is perhaps desirable to take the entire perspective of personality into account, instead of treating interest in isolation.

Scope for Further Research

Loose ends of a research might encourage other researchers to get hold of them and link them up in other directions. The scope of the present enquiry has to be limited for practical purposes and may lead to many investigations. The types of tests used in the investigation are limited and some of them are not conventional but have proved promising in this investigation. For example, the projective type of test (How much how many) and the situational type of test (News items) have come out significantly loaded with the first factor identifiable as the factor of interest. There is a scope for evolving some more objective measures of interest for building up a scientific basis of interest. There exists a further scope for extending the number of environmental variables for a relative study of their main effects in various culture contexts. The more crucial problem is around the development of interest

from childhood to maturity. It would be worthwhile to take a number of longitudinal studies on parallel lines for throwing more light on the process of interest formation.

Summary

The results of the investigation are important as they prove or disprove the hypotheses. The findings obtained in the present investigation indicate the various trends in interest scores derived from the study. The tests battery has been found to be significantly reliable and its factorial validity has also been established. The test battery was used in the main investigation for obtaining two sets of information, one on interest scores and the other on environment of the subjects. The range, mean and standard deviations of the interest scores vary considerably from interest to interest and group to group. The tests discriminate between subjects to a significant extent and a dominant interest is observable for each group. This partly supports the hypotheses that it is possible to draw some line of demarcation between one interest area and the other. Factorial analysis was used for the study of the possible basic patterns of interest. The results of the analysis, however, indicate the existence of three fundamental trends and also of a considerable overlap

between the areas of interest. The study of the relationship between interest and environment has been attempted by bringing the two sets of score in a suitable design of analysis of variance. It has been found out that out of the five variables besides considerations all have significant effect on most of the areas of interest. The study of interaction between the environmental variables has also proved revealing. The results indicate a significant interaction between environmental factors themselves in certain cases.

In short, the results of the investigation are mostly in favour of the hypotheses built up and suggest further scope for exploration.