CHAPTER X

COMPARISON OF BEHAVIOURAL AND ENVIRONMENTAL CORRELATES OF ACADEMIC ACHIEVEMENT OF TOTAL FINAL CLASS, OVER- AND UNDER-ACHIEVERS AND OVER- AND UNDER-ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE
ACHIEVEMENT OF TOTAL FINAL SAMPLE, OVER- AND UNDER-ACHIEVERS AND OVER- AND UNDER-ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE

The present chapter aims at presenting a comparative study of behavioural and environmental correlates of academic achievement of the total final sample, over- and under-achievers at different stages (Chapter IV). It revolves around the testing of the following hypothesis:

Significant mean differences exist among the total group (TFS), total groups of over- and under-achievers and over- and under-achievers at three different levels of intelligence in respect of certain behavioural and environmental correlates of academic achievement. (The hypothesis is restricted to the testing of correlates 'common' to (i) three groups (TFS, OAs and UAs) or (ii) any of these two groups as identified in Chapter VI).

To test this hypothesis, only t-test technique was applied because this was the statistical technique which could be applied at all the stages of study for the sake of comparison of correlates of academic achievement at these stages. Table 10.1 provides the ingredients concerning the testing of the above hypothesis. Besides means of thirty four independent variables, it includes thirty four sets of t-values. Each set represents six t-values for one variable at a time and comparison of mean differences within different groups is made. Row-wise t-values of Table 10.1 represent comparison of mean scores between the total final sample and the over-achievers (TFS-OAs), the total final sample and the under-achievers (TFS-UAs), over- and under-achievers (OAs-UAs), over- and under-achievers at low level of
### TABLE 10.1

<table>
<thead>
<tr>
<th>Difference Levels of Intelligence</th>
<th>TPS</th>
<th>GEP</th>
<th>HCP</th>
<th>DEP</th>
<th>TPS</th>
<th>GEP</th>
<th>HCP</th>
<th>DEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Mean HC0M &amp; OF BEHAVIOURAL AND ENVIRONMENTAL MEASURES OF UNDERSCHIEVERS AND OVERTS UNDER-ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>significance at .05 level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>significance at .01 level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>significance at .001 level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: TPS = Total Phenotypic Score; GEP = Genetic and Environmental Phenotypic Score; HCP = Heritable and Environmental Phenotypic Score; DEP = Total Environmental Phenotypic Score.
intelligence \((OA_{\text{h}}-UA_{\text{h}})\), over- and under- achievers at average level of intelligence \((OA_{\text{a}}-UA_{\text{a}})\) and lastly the over- and under- achievers at high level of intelligence \((OA_{\text{h}}-UA_{\text{h}})\). All these are represented in the same serial order in which they have been referred to here. For the sake of convenience of discussion and for having a clear picture of different areas studied this Table is further divided into six sub-tables 10.1.1 to 10.1.6 and summary of only t-values is presented in them. Mean profiles of the thirty-four independent variables for all the nine groups \((TFS, OAs, UAs, OA_{\text{h}}, UA_{\text{h}}, OA_{\text{a}}, UA_{\text{a}}, OA_{\text{h}}, UA_{\text{h}})\) have been drawn and are represented in Figures 10.1 to 10.34. This has been done with a view of facilitating visual perception of the results and making the correlates of academic achievement (TFS) as the reference point and seeing the position of the correlates of academic achievement of over- and under- achievers as well as the over- and under- achieving groups at three different levels of intelligence.

**RESULTS**

MEASURES OF ADJUSTMENT, ACADEMIC ACHIEVEMENT AND OVER- AND UNDER- ACHIEVEMENT

Table 10.1.1 presents six t-values for each of the four areas of adjustment and their total scores for comparing mean scores between different groups representing academic achievement and over- and under- achievement in the order in which they have been mentioned earlier in this chapter.
MEAN PROFILES OF 'HA', 'SA', 'HEA' & 'SCA' FOR NINE GROUPS
SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS ON MEASURES OF ADJUSTMENT FOR THE TOTAL FINAL SAMPLE OVER- & UNDER-ACHIEVERS AND OVER- & UNDER-ACHIEVE AT DIFFERENT LEVELS OF INTELLIGENCE

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable (Code)</th>
<th>TFS-OAs</th>
<th>TFS-UAs</th>
<th>OAs-UAs</th>
<th>OAs-UA1</th>
<th>OA-UAs</th>
<th>OA-UAH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>HA</td>
<td>-5.08*</td>
<td>3.64*</td>
<td>3.37*</td>
<td>2.83*</td>
<td>5.16*</td>
<td>5.68*</td>
</tr>
<tr>
<td>2.</td>
<td>SA</td>
<td>-2.59*</td>
<td>1.98**</td>
<td>3.79*</td>
<td>1.39*</td>
<td>3.09*</td>
<td>1.87</td>
</tr>
<tr>
<td>3.</td>
<td>HEA</td>
<td>-2.61*</td>
<td>1.98**</td>
<td>3.89*</td>
<td>1.07</td>
<td>3.87*</td>
<td>1.33</td>
</tr>
<tr>
<td>4.</td>
<td>SCA</td>
<td>-9.05*</td>
<td>5.87*</td>
<td>13.88*</td>
<td>4.59*</td>
<td>11.55*</td>
<td>7.86*</td>
</tr>
<tr>
<td>5.</td>
<td>TA</td>
<td>-6.14*</td>
<td>4.46*</td>
<td>9.56*</td>
<td>3.23*</td>
<td>7.54*</td>
<td>5.43*</td>
</tr>
</tbody>
</table>

Academic Achievement, Overs achievem ent (TFS-OAs) And Adjustment:

High t-values in Table 10.1.1 indicate that the two groups differed significantly at .01 level on all the four areas of adjustment, that is, home adjustment (HA), social adjustment (SA), health and emotional adjustment (HEA), school adjustment (SCA) and also the total adjustment (TA) of these areas. Negative signs in all the five t-values show that the overachieving group (OAs) had better adjustment than the total final sample (TFS) in all these areas.

Academic Achievement, Underachievement (TFS-UAs) And Adjustment:

These two groups differed significantly at .01 level for three types of adjustment, that is, home adjustment (HA), school adjustment (SCA) and total adjustment (TA). Positive t-values of 3.64, 5.87 and 4.46 (vide Table 10.1.1) for all these areas respectively show that in all these three areas, total final sample (TFS)

* Sig. at .01 level; ** Sig. at .05 level.
was having greater mean scores, thus showing that the total group (N=761) had better adjustment as compared to the underachieving group. The highest mean difference as is obvious from the results, was for school adjustment (SCA), that is, the overall total group (TFS) had better school adjustment.

For the rest of the two areas, that is, social adjustment (SA) and health and emotional adjustment (HEA), total final sample was better too, though the difference was significant at .05 level.

Over- & Under-Achievement (OAs-UAas) And Adjustment:

As can be seen from the Table 10.1.1, positive t-values of 7.37, 3.79, 3.89, 13.80 and 9.56 are all significant beyond .01 level for all the four areas of adjustment and their totals. So this shows that overachievers were much better adjusted in all these areas.

Over- & Under-Achievement At Low Level of Intelligence (OAs-UAas) And Adjustment:

Table 10.1.1 indicates that out of the 5 areas of adjustment, over- and under-achievers of low level of intelligence differed significantly at .01 level, for areas of home, school and total adjustment (HA, SCA and TA). For the rest of the two areas that is, social adjustment (SA) and health and emotional adjustment (HEA), t-values did not reach the level of significance. Yet, on the whole, all the five positive t-values show that overachievers at low level of intelligence were better adjusted than the underachievers at their corresponding level of intelligence.
Over- & Under-Achievement At Average Level Of Intelligence (OA<sub>a</sub>-UA<sub>a</sub>) And Adjustment:

All the five positive t-values of the over- and under-achievers at average level of intelligence (vide Table 10.1.1) show that overachievers were better adjusted than the under-achievers for all the five areas of adjustment (HA, SA, HEA, SCA, TA), mean difference between them being significant at .01 level.

Over- & Under-Achievement At High Level Of Intelligence (OA<sub>H</sub>-UA<sub>H</sub>) And Adjustment:

Table 10.1.1 shows that of the five areas of adjustment, overachievers of high mental calibre were better than underachievers in the areas of home, school and total adjustment (HA, SCA and TA), difference being significant beyond .01 level. For the area of social adjustment (SA), overachievers were better than underachievers at .10 level only. For the area of health and emotional adjustment, the difference was on the positive side, that is overachievers were better than the underachievers but then the difference did not reaching statistical level of significance.

Significantly higher mean scores on total adjustment of overachievers belonging to high ability as compared to underachievers of corresponding ability is an empirical evidence to prove that overachievers of upper level of ability are better adjusted than the underachievers of the same ability. Pierce (1962) observed similar results. Smith (1965) also obtained similar positive findings for the overachievers in the area of school adjustment.
MEAN PROFILES OF 'TA', 'A', 'B' & 'C' FOR NINE GROUPS
Table 10.1.2 represents fourteen sets of six t-values each. Each set represents comparison of mean scores between different groups for each of the fourteen measures of personality.

**TABLE 10.1.2**

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS ON MEASURES OF PERSONALITY FOR THE TOTAL FINAL SAMPLE, OVER- & UNDER-ACHIEVERS AND OVER- & UNDER-ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable (Code)</th>
<th>Group Compared (t-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TFS-OA</td>
<td>TFS-UA</td>
</tr>
<tr>
<td>6.</td>
<td>A</td>
<td>-1.03</td>
</tr>
<tr>
<td>7.</td>
<td>B</td>
<td>-3.01*</td>
</tr>
<tr>
<td>8.</td>
<td>C</td>
<td>-1.47</td>
</tr>
<tr>
<td>9.</td>
<td>D</td>
<td>1.34</td>
</tr>
<tr>
<td>10.</td>
<td>E</td>
<td>1.50</td>
</tr>
<tr>
<td>11.</td>
<td>F</td>
<td>-1.52</td>
</tr>
<tr>
<td>12.</td>
<td>G</td>
<td>-0.71</td>
</tr>
<tr>
<td>13.</td>
<td>H</td>
<td>-2.94*</td>
</tr>
<tr>
<td>14.</td>
<td>I</td>
<td>0.50</td>
</tr>
<tr>
<td>15.</td>
<td>J</td>
<td>-0.69</td>
</tr>
<tr>
<td>16.</td>
<td>O</td>
<td>0.33</td>
</tr>
<tr>
<td>17.</td>
<td>02</td>
<td>-1.02</td>
</tr>
<tr>
<td>18.</td>
<td>03</td>
<td>-1.81</td>
</tr>
<tr>
<td>19.</td>
<td>04</td>
<td>1.91</td>
</tr>
</tbody>
</table>

* Sig. at .01 level  ;  ** Sig. at .05 level.
MEAN PROFILES OF 'D', 'E', 'F' & 'G' FOR NINE GROUPS
Academic Achievement, Overshaevement (TFS-OAs) And Personality:

The above Table 10.1.2 indicates that t-values of fourteen personality traits, including factor B of intelligence between the total final sample and overachievers (TFS-OAs) do not differ significantly except for two personality traits, that is, for personality Factors 'B' (intelligence) and 'HI (shy-versus-venturesome) on which overachievers were scoring higher. Significant difference on factor B of intelligence shows at the outset that the results are paradoxical in the sense that in Chapter IV, vide Table 4.8, it was established that the two groups did not differ in intelligence, yet if details of the results (vide Table 4.8) are seen, overachievers had a greater mean in verbal intelligence as compared to both the total final sample and the underachievers. On the whole, however, after combining the scores on both non-verbal intelligence and verbal intelligence (DICL_comb) there were no significant differences at all. Here Factor 'B' of Cattell's High's school personality Questionnaire measures only verbal intelligence, hence this difference is observed.

Significant mean differences on Factor 'H' of personality show that overachievers were more venturesome, socially bold, uninhibited and spontaneous, that is, they possessed more of 'parrisia' dimension of personality (Cattell, 1962) than the total final sample who were comparatively shy, restrained, diffident and timid. They possess more of 'threctia' dimension of personality (Cattell, 1962), so, in a way, in words of Cattell (1963b) overachievers were, comparatively more 'thick skinned' who could face "wear and tear in dealing with people and grueling emotional situations, without fatigue."


MEAN PROFILES OF 'H', 'I', 'J', & 'O' FOR NINE GROUPS
For the rest of the twelve personality variables, no statistically significant differences were found, leading to the conclusion that except for the differences mentioned above, there were hardly any differences in these measures with regard to the total final sample and the over-achievers. However, Figures 10.6 to 10.19 show that there are certain personality factors which go more with over-achievers and others, more with the total final sample.

Academic Achievement, Underachievement (TFS-UAs) And Personality:

Table 10.1.2 shows that out of the fourteen factors of personality not a single mean difference is statistically significant at any of the accepted levels of significance, except for personality Factor B (intelligence), where the total final sample achieved significantly (0.05 level) more than the under-achievers. This means that the personality traits of the under-achievers did not deviate much from the personality traits of the total final sample on the whole. Too much similarity of position in these traits as is represented in Figures 10.1.6 to 10.1.19 also substantiate the same point.

Over- & Under-Achievement (OAs-UAs) And Personality:

Significant mean differences (vide Table 10.1.2 and Figures 10.1.6 to 10.1.19) can be observed for a few of the personality factors between these two extreme discrepant academic achievement groups. These differences are for Factors 'B', 'E', 'F'.
FIG. 10.18
MEAN SCORES
'O.3'

FIG. 10.19
MEAN SCORES
'O.2'

FIG. 10.17
MEAN SCORES
'O.1'

FIG. 10.20
MEAN SCORES
'O.4'

GROUPS

GROUPS

FOR NINE GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS

GROUPS
'H' and 'G'. So far as factor 'B' is concerned, it represents the verbal factor of intelligence. No doubt overachievers and underachievers did not differ significantly with regard to their mean $D_{IO_{comb}}$ but Table 4.8 clearly reveals the fact that overachievers were better with regard to verbal intelligence and underachievers were better in non-verbal intelligence. However, when both types of intelligence were combined together by $D_{IO_{comb}}$, there was hardly any difference left in the standard of intelligence of both the groups. So the explanation of why overachievers achieved more in factor 'B' of intelligence, as has been given under the caption of 'total final sample and overachievers (TFS-OAs) and personality' stands true over here as well.

Higher mean score of overachievers on Factor 'F' technically named as 'surgency' means that overachievers were more lively, happy-go-lucky, gay and enthusiastic personalities having leadership qualities, whereas, the underachievers tended to be comparatively restrained, introspective and pessimistic personalities.

Higher mean score of underachievers on Factor 'E', technically named as 'dominance' that underachievers were more assertive, independent, aggressive and stubborn personalities whereas the overachievers tended to be comparatively submissive, obedient, mild and conforming personalities.

Overachievers achieved higher on Factor 'H' both as compared to the total final sample as well as the underachievers. Here it means that underachievers were comparatively more shy, restrained different and timid. Such personalities are technically named as 'thectia' whereas overachievers had 'permia' (Cattell, 1962) personality explained earlier.
Positive t-value (t = 1.97) on Factor Q₃ means that overachievers exhibited higher self-concept as compared to the undersachievers who were characterized by low integration.

Over- & Under-Achievement At Low Level Of Intelligence (OA₁-UA₁) And Personality:

Table 10.1.2 shows that out of the fourteen t-values between overachieving and underachieving groups of low level of intelligence for the fourteen personality dimensions, only three t-values are significant and those too, at .05 level. These significant t-values are for personality Factors 'B', 'E' and 'Q₃'. Positive t-values for Factor B and show that overachievers at even low level of intelligence were better in abstract thinking (B+) as compared to the underachievers of equivalent level of intelligence. The explanation that has already been given earlier for superiority of factor 'B' for the overachieving group stands true over here too.

Significant negative t-value on Factor 'E' shows that the mean scores of the underachieving group is significantly greater. Thus overachievers of low level of intelligence were comparatively more submissive, humble, mild, accommodating and conforming (E-) whereas the underachievers of low level of intelligence were more dominant, assertive, independent, aggressive and stubborn.

Besides, overachievers of low mental ability had comparatively higher self-concept control (Q₃+) than the the equivalent group of undersachievers who had low integration.
Over- & Under-Achievement At Average Level Of Intelligence (OAₐ-UAₐ) And Personality:

There are five significant t-values (vide Table 13.1.2) between over- and under-achievers at average level of intelligence. The factors which show significant t-values are personality factors A, B, D, H and G. Out of these, four are positive, that is, over-achievers at this level of intelligence obtained higher mean scores than under-achievers for Factors A (warm hearted), B (intelligence), H (social boldness) and G (high self concept control) and under-achievers at this level obtained greater mean score for Factor D (excitability) as compared to the corresponding group of over-achievers.

Two more personality factors showed mean differences which were significant at .10 level. These were the personality factors 'E' and 'F', the under-achievers obtaining more mean score on Factor 'E' (assertive) as compared to the over-achievers of the same level of intelligence and over-achievers obtained more mean scores than their corresponding group of under-achievers for personality Factor 'F' (happy-go-lucky).

Over- & Under-Achievement At The High Level Of Intelligence (OAₜ-UAₜ) And Personality:

t-values (vide Table 10.1.2) show that over- and under-achievers at high level of intelligence had mean differences on Factor 'B' and 'H', differences being significant at .05 level. Positive t-values again show that over-achievers attained higher mean scores than the under-achievers on both these factors. Thus
overachievers of high level of intelligence had higher scholastic mental capacity and had more abstract thinking (B+) than the corresponding group of underachievers.

Besides, overachievers at this level of intelligence were venturesome, socially-bold, uninhibited and spontaneous (H+) as compared to their underachieving counterpart, who were comparatively more shy, restrained, diffident and timid.

For the rest of the twelve personality factors, no significant mean differences between the two contrasting groups of over- and under-achievers were observable except for Factor 'F' where the mean differences between them are significant at .10 level. Thus overachievers of high mental calibre were more happy-go-lucky lively gay, enthusiastic (urgency) as compared to the underachievers of high mental calibre.

The above findings confirm the fact that a few significant personality differences are observable between over- and under-achievers and over- and under-achievers at different levels of intelligence. Riggs (1970) also observed personality differences among groups of overachievers and underachievers of differential levels of academic potentials. Schwab (1969), however, while comparing personality profiles of over- and under-achievers of high and low ability university students failed to yield discernible results.

MEASURE OF STUDY HABITS AND ATTITUDES, ACADEMIC ACHIEVEMENT AND OVER- & UNDER-ACHIEVEMENT

Table 10.1.3 given below presents a set of six t-values for the measure of study habits and attitudes. The pairs of groups compared are the same as were there for the different areas of adjustment as well as personality.
MEAN PROFILES OF 'SHA', 'S2 AM', 'S2 AM', & 'TAM' FOR NINE GROUPS

FIG. 10.21

FIG. 10.22

FIG. 10.23

FIG. 10.24

MEAN PROFILES OF 'SHA', 'S1 AM', 'S2 AM', & 'TAM' FOR NINE GROUPS

MEAN PROFILES OF 'SHA', 'S1 AM', 'S2 AM', & 'TAM' FOR NINE GROUPS

MEAN PROFILES OF 'SHA', 'S1 AM', 'S2 AM', & 'TAM' FOR NINE GROUPS

MEAN PROFILES OF 'SHA', 'S1 AM', 'S2 AM', & 'TAM' FOR NINE GROUPS
### TABLE 10.1.3

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS ON MEASURES OF STUDY HABITS AND ATTITUDES FOR THE TOTAL FINAL SAMPLE, OVER- & UNDER-ACHIEVERS AND OVER- & UNDER-ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE

<table>
<thead>
<tr>
<th>S. No</th>
<th>Variable (Code)</th>
<th>Group Compared (t-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TFS- OAs</td>
</tr>
<tr>
<td>21</td>
<td>SHA</td>
<td>-4.91*</td>
</tr>
</tbody>
</table>

Academic Achievement, Overachievement (TFS-OAs) And Study Habits And Attitudes:

The first t-value of Table 10.1.3 shows a value of -4.91. This means that the overachievers (OAs) on the whole had significantly (.01 level) better study habits and positive attitudes than the total sample representing total range of achievement. This also throws light on the fact that overachievers had lesser academic difficulties as compared to the total sample. Figure 10.21 also represents the same results.

Academic Achievement, Underachievement (TFS-UAs) And Study Habits And Attitudes:

Mean differences of composite score of study habits and attitudes (SHA) as is represented in Table 10.1.3 and Figure 10.21 show that the total final sample (TFS) is scoring much more than the underachievers (UAs) and the positive t-value of 2.35 is significant beyond .05 level. This means that, on the whole, the population had better study habits and more positive attitudes than the underachieving group.

* Sig. at .01 level; ** Sig. at .05 level.
Over- & Under-Achievement (OAs-UAAs) And Study Habits And Attitudes:

On the whole, the total final sample had higher mean score on study habits and attitudes than the underachievers and overachievers scored higher than the total final sample. Obviously then overachievers had still higher mean score than the underachievers which is reflected by the positive t-value of 5.81 and the grammatical presentation of mean scores in Figure 10.21. Perkins (1965) in his studies, stressed the fact that faulty study habits can be the causal agent of underachievement. Garris (1968) and Pelcovitz (1971) also observed significant differences between study habits of over- and under-achievers. Lum (1960) obtained results which were at odd with these findings.

Over- & Under-Achievement At Low Level Of Intelligence (OAS-UAAS) And Study Habits And Attitudes:

Significant positive t-value of 2.657 (vide Table 10.1.3) between the over- and under-achievers of low level of intelligence, thus, again, confirm the fact that overachievers were better than the underachievers when they were studied at one level of intelligence only (low level). Figure 10.21 also represents some significant differences.

Over- & Under-Achievement At Average Level Of Intelligence (OAS-UAAS) And Study Habits And Attitudes:

Significant t-value of $t = 3.552$ (vide Table 10.1.3) and self-evident differences as are pictorially presented (vide Figure 10.21) show that the mean differences between over- and under-achievers of average level of intelligence were all the more greater than even the mean differences of over- and under-achievers at low level of
Intelligence. Positive t-value shows comparatively greater superiority of study habits and attitudes of the oversachievers at average ability level as compared to their underscoring counterpart.

Over-Achievement At High Level Of Intelligence ($OA_h - UA_h$) And Study Habits And Attitudes:

Mean differences between the over- and under-achievers at high level of ability are once again proved beyond doubt. Table 10.1.3 indicates that t-value ($t = 4.29$) is highest of all the three levels of ability studied overhere. Thus oversachievers again showed their upper-hand in better study habits and healthy constructive attitudes as compared to the undersachievers of high level of intelligence. Pictorial representation (Figure 10.21) also substantiates the results.

MEASURES OF ACHIEVEMENT MOTIVATION, ACADEMIC ACHIEVEMENT AND ACADEMIC OVER- AND UNDER- ACHIEVEMENT

Table 10.1.4 given below represents three sets of six t-values for the three measures of achievement motivation.

**TABLE 10.1.4**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable (Code)</th>
<th>Group Compared (t-values)</th>
<th>$TFS^- _{OA}$</th>
<th>$TFS^- _{UA}$</th>
<th>$OA^- _{OA}$</th>
<th>$OA^- _{UA}$</th>
<th>$OA^- _{UA}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.</td>
<td>$S_{1AM}$</td>
<td></td>
<td>-3.43$^*$</td>
<td>2.46$^*$</td>
<td>4.68$^*$</td>
<td>1.57</td>
<td>3.71$^*$</td>
</tr>
<tr>
<td>23.</td>
<td>$S_{2AM}$</td>
<td></td>
<td>-3.10$^*$</td>
<td>1.99$^*$</td>
<td>3.78$^*$</td>
<td>2.13$^{**}$</td>
<td>2.73$^*$</td>
</tr>
<tr>
<td>24.</td>
<td>TAM</td>
<td></td>
<td>-4.28$^*$</td>
<td>2.89$^*$</td>
<td>5.68$^*$</td>
<td>2.17$^{**}$</td>
<td>4.26$^*$</td>
</tr>
</tbody>
</table>

* Sig. at .01 level; ** Sig. at .05 level.
Academic Achievement, Academic Overachievement (TFS-OAs) And Achievement Motivation:

Achievement motivation scores as they are measured by two projective type of stories and their total ($S_1AM$, $S_2AM$ and $TAM$), show three negative t-values of $-3.43$, $-3.10$ and $-4.28$ (vide Table 10.1.4) between the total final sample and the over-achievers (TFS-OAs) in respect of these measures of achievement motivation. This means that overachievers had greater means on each of the stories as well as on the whole. The same trend is further exemplified by Figures 10.22 to 10.24.

Academic Achievement, Underachievement (TFS-UAs) And Achievement Motivation:

Positive t-values (vide Table 10.1.4) of $2.46$, $1.99$ (significant at .05 level) and $2.89$ (significant at .01 level) for mean differences between achievement motivation expressed through first story ($S_1AM$), second story ($S_2AM$) and the total score shows that the total sample had much higher achievement motivation than the underachievers (UAs). Figures 10.22 to 10.24 also represent the same trend.

Over- & Under-Achievement (OAe-UAs) And Achievement Motivation:

All the three positive and highly significant t-values ($t = 4.68$, $3.78$ and $5.68$) vide Table 10.1.4 for all the three variables of achievement, confirm that the overachievers (As) had much more n-Ach than the underachievers (UAs). Figures 10.22 to 10.24 add to the pictorial representation of these results. Present findings are in line with the findings of McArthur (1953), Lum (1960), Farquhar (1963), Garms (1969), Hall and McClelland (1972).
Table 10.1.4 indicates that out of the three positive t-values obtained between the over- and under-achievers of low mental ability for the three measures of achievement motivation, two are significant at .05 level, that is, mean score differences between the second story and the total achievement scores \(S_2AM\) and \(TAM\) and the third t-value \(t = 1.571\) shows the same trend. But perhaps, just because the undersachievers at low level of intelligence were very few in number \(N = 23\), the results are not that evident which they would have been, had there been larger sample. These results are substantiated by Figures 10.22 to 10.24.

Over- & Under-Achievement At Average Level of Intelligence \((OA_A-UA_A)\) And Achievement Motivation:

Table 10.1.4 indicates highly significant t-values (significant beyond .01 level) for all the three measures of achievement motivation, magnitude \(K\)-values being 3.71, 2.73 and 4.26 for first story, second story and the total achievement motivation scores \(S_1AM, S_2AM\) and \(TAM\) respectively. Thus oversachievers at average level of mental ability exhibited higher achievement motivation \(n-Ach\) as compared to the undersachievers of equivalent level of ability. Figures 10.22 to 10.24 give pictorial view of the above results.

Over- & Under-Achievement At High Level Of Intelligence \((OA_H-UA_H)\) And Achievement Motivation:

Table 10.1.4 represents that again when over- and undersachievers of high mental calibre were compared on the basis of
FIG. 10.25
MEAN PROFILES OF 'FA', 'LIT', 'SC' & 'MD' FOR NINE GROUPS
three measures of achievement motivation, this led to the
obtaining of three significant t-values of 2.52, 2.12 (at .05
level) and 3.22 (at .01 level) for the mean scores of first and
second story and the total scores respectively. Thus, this
again statistically confirmed the fact that oversachievers of
high mental calibre were much more superior than the under-
achievers of the corresponding level of intelligence in their
need to achieve higher and better. Figures 10.22 to 10.24 sub-
stantiate the same results.

MEASURES OF INTEREST, ACADEMIC ACHIEVEMENT AND OVER- & UNDER-
ACHIEVEMENT:

Summary of results for different areas of interest showing
mean differences with regard to different groups studied at diff-
rent stages overhere is presented in Table 10.1.3 and Figures
10.25 to 10.34.

TABLE 10.1.3
SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS ON MEASURES OF INTEREST
FOR THE TOTAL FINAL SAMPLE, OVER- & UNDER-Achievers and OVER- & UNDER-
ACHIEVERS AT DIFFERENT LEVELS OF INTELLIGENCE

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable (Code)</th>
<th>Group Compound (t-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TPS- OAs</td>
</tr>
<tr>
<td>25.</td>
<td>FA</td>
<td>0.51</td>
</tr>
<tr>
<td>26.</td>
<td>LIT</td>
<td>-1.66</td>
</tr>
<tr>
<td>27.</td>
<td>SC</td>
<td>-1.33</td>
</tr>
<tr>
<td>28.</td>
<td>MD</td>
<td>-1.76</td>
</tr>
<tr>
<td>29.</td>
<td>AG</td>
<td>-0.10</td>
</tr>
<tr>
<td>30.</td>
<td>TBCH</td>
<td>1.23</td>
</tr>
<tr>
<td>31.</td>
<td>CR</td>
<td>2.78*</td>
</tr>
</tbody>
</table>

Contd.
MEAN PROFILES OF 'AG', 'TECH', 'CR' & 'OD' FOR NINE GROUPS
Table 10.1.5 Contd.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32. OD</td>
<td>-0.06</td>
<td>-1.14</td>
<td>-0.87</td>
<td>0.19</td>
<td>-0.30</td>
<td>-1.56</td>
</tr>
<tr>
<td>33. SP</td>
<td>-0.58</td>
<td>-0.39</td>
<td>0.13</td>
<td>0.26</td>
<td>0.27</td>
<td>-0.45</td>
</tr>
<tr>
<td>34. HH</td>
<td>1.65</td>
<td>-3.05*</td>
<td>-3.80*</td>
<td>-0.82</td>
<td>-2.41**</td>
<td>-2.46**</td>
</tr>
</tbody>
</table>

Academic Achievement And Academic Overs achievement (TFS-OAs)
And Measures Of Interest:

Table 10.1.5 represents that so far as ten different areas of interest are concerned, there is hardly any statistically significant difference except for the interest area of 'Crafts' where the total group as a whole scored more. That means that oversachievers had less interest in craft-centred activities than the undersachievers. But if statistical level of significance is ignored and the pictorial study of the total final sample (TFS) and oversachievers with regard to differences in interest are studied (Figures 10.25 to 10.34) that does show that there were certain interest areas where oversachievers and the total final sample scored differentially.

Academic Achievement And Academic Unders achievement (TFS-UAs)
And Measures Of Interest:

Out of the ten interest areas studied over here, mean differences between the total sample (TFS) and the undersachievers (vide Table 10.1.5) show that undersachievers were more interested in fine arts (FA), technical or mechanical (TECH) and outdoor (OD) activities, than the total final sample but none of these differences

* Sig. at .01 level  ;  ** Sig. at .05 level.
MEAN PROFILES OF 'SP' & 'HH' FOR NINE GROUPS
reached the level of significance, their t-values being \(-1.73\), \(-1.79\) and \(-1.14\) respectively. Two areas in which these two groups differed significantly beyond .01 level are those of crafts (CR) and household activities (HH), underachievers scoring higher in these areas of interest. There was no such interest area where the total group (TFS) was scoring higher mean than the total group of underachievers.

**Over-\& Under-Achievement (OA\(_a\)-UA\(_a\)) And Measures of Interest**

A few significant differences in means of interest (vide Table 10.1.5) show that the underachievers had higher mean scores in technical activities (significant beyond .05 level), crafts and household activities (both significant beyond .01 level) as compared to oversachievers. In none of the interest areas oversachievers were achieving significantly higher mean than the underachievers. Figures 10.25 to 10.34 substantiate these results. On the whole, interests as expressed through non-verbal preference record by Chatterji do not discriminate much except for the above exceptions. Douglas (1973), Wendt (1967), Lewis (1967), Sinha (1970) and many others have reported negligible utility of interests in predicting academic achievement.

**Over-\& Under-Achievement At Low Level Of Intelligence (OA\(_1\)-UA\(_1\)) And Measures Of Interest**

Table 10.1.5 represents that no t-value is significant at .01 level for any one of the ten areas of interest. Only one t-value which is significant at .05 level is for the interest area of crafts (CR), underachievers of low mental level showing higher mean score \((t = -2.00)\) than the oversachievers of the
corresponding level of intelligence. Figures 10.25 to 10.34
pictorially presents these results.

Over- & Under-Achievement At Average Level Of Intelligence (OAₐ-UAₐ)
And Measures Of Interest:

Table 10.1.5 indicates that out of the ten areas of
interest, only two t-values which are significant at .01 and
.05 levels are for the interest areas of crafts (CR) and house-
hold activities (HH) respectively underachievers of average mental
level exhibited greater interest in these areas. Another area of
interest which is showing significant mean difference at .10
level is for technical activities, underachievers again showed
greater interest than the overachievers. Figures 10.25 to 10.34
pictorially represent these results.

Over- & Under-Achievement At High Level Of Intelligence (OAₜ-UAₜ)
And Measures Of Interest:

Table 10.1.5 indicates that there are greater number of
mean differences between over- and under-achievers of high mental
level as compared to the over- and under-achievers of low and
average level of intelligence. Three areas of interest which showed
significant mean differences at .01 or .05 level are those of
fine arts (FA), crafts (CR) and household activities (HH), under-
achievers scoring higher than the overachievers of the corres-
ponding level of intelligence. There was no interest area where
overachievers of high mental calibre were showing greater mean
differences except for the interest area of science (SC) where
the positive t-value of 1.757 showed that the overachievers had
greater interest in scientific activities, but the level of significance was only .10 and hence was not acceptable.

MEASURE OF SOCIO-ECONOMIC STATUS, ACADEMIC ACHIEVEMENT AND ACADEMIC OVER-AND UNDER-ACHIEVEMENT

Summary of results of environmental factor of socio-economic status ($V_{20}$) as it goes with academic achievement or over- and under-achievement has been presented in Table 10.1.6 and Figure 10.20.

TABLE 10.1.6

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Variable (Code)</th>
<th>Group Compared (t-values)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TFS-OAs</td>
<td>TFS-UAs</td>
</tr>
<tr>
<td>20.</td>
<td>SES</td>
<td>-7.15*</td>
</tr>
</tbody>
</table>

Academic Achievement, Overshievement (TFS-OAs) and Socio-Economic Status:

In the present study only one composite score of socio-economic status as an environmental factor affecting scholastic achievement was studied. Here mean difference of 6.13 (Table 10.1.6) between the total final sample and the oversachievers show that it is statistically significant beyond .01 level ($t = -7.15$). That means that oversachievers had much better socio-economic background as compared to the total group (TFS). Figure 10.20 also substantiates the same results.

* Sig. at .01 level.
Academic Achievement, Underachievement (TFS-UAs) And Socio-Economic Status:

Highly significant (beyond .01 level) and positive t-value of 4.54 (vide Table 10.1.6) shows that the total group (TFS) was better than total group of underachievers (UAs) in socio-economic status. Figure 10.20 pictorially represents the same results. Hammond and Cox (1968) obtained similar results and stressed that social class is an important factor in academic achievement.

Over- & Under-Achievement (OAs-UAs) And Socio-Economic Status:

Obviously if the total final sample was better than the underachievers in socio-economic status and overachievers were better than the total final sample in the same measure, then overachievers were all the more better in socio-economic status, than the underachievers. Positive t-value of 10.49 shows that overachievers have much better social as well as economic background taken as a whole. Figure 10.20 represents the same results. Fankel (1960), McGillivray (1964), Riggs (1970) all have reported similar findings whereas McDonald (1964) and Simpson (1970) have reported contradictory results.

Over- & Under-Achievement At Low Level Of Intelligence (OA₁-UA₁) And Socio-Economic Status:

Table 10.1.6 and Figure 10.20 confirm the above results that overachievers had higher socio-economic status as compared to the underachievers even when these two levels of predicted achievement were compared on just one level of intelligence, that is, low level.
Over-A Under-Achievement At Average Level Of Intelligence (OAₐ-UAₐ) And Socio-Economic Status:

Positive and highly significant t-value \((t = 6.605)\) as represented in Table 10.1.6 again shows the superiority of over-achievers of average intelligence as compared to the underachievers of the corresponding level of intelligence for the measure of socio-economic level. Figure 10.20 substantiates these findings.

Over-A Under-Achievement At High Level Of Intelligence (OAₐ-UAₐ) And Socio-Economic Status:

Table 10.1.6 refers to positive t-value of 8.061 which is highly significant. This means that the over-achievers of high level of intelligence (OAₐ) were much better than their counter-group (UAₐ) so far as socio-economic status was concerned. This t-value is highest of all the three t-values obtained between the over- and under-achieving groups of three levels of intelligence for the environmental factor. The environmental factor can be one of the causes of overachievement of underachievement particularly at higher level of intelligence where the mean differences are so glaring. Figure 10.20 pictorially represents the same results.

DISCUSSION OF RESULTS

HYPOTHESIS I:

Summary of results based on t-values shows that out of the six pairs of groups compared (TFS-OAs, TFS-UAs, OAs-UAa, OA₁-UA₁, OAₐ-UAₐ and OAₐ-UAₐ) in respect of all the thirty four behavioural and environmental measures, only nine measures significantly differentiated between all these pairs of groups. (HA, SCA,
TA, B, SHA, S_AK, TAM, CR and SES). In eight of these nine measures, over-achievers scored more than the total group, showing signs of more home, school and total adjustment, had better crystallized intelligence, comparatively better study habits and attitudes, higher achievement motivation scores in the second story and the total and belonged to better socio-economic status than the total group (TPS). The total group, however, expressed greater interest in craft-centred activities.

Besides, overachievers as a whole and also at three levels of intelligence significantly surpassed the mean scores of their corresponding group of underachievers in the above eight measures except for the interest area of crafts where the underachievers scored more.

In addition, achievement motivation expressed through first story differentiated between five out of the six pairs of groups. This measure did not significantly differentiate between the over-and under-achievers at low level of intelligence.

Four more behavioural measures which significantly differentiated between four out of the six pairs of groups are those of social adjustment, health and emotional adjustment, Parma factor of personality and interest in household activities (SA, HEA, H and HH), overachievers obtaining significantly greater mean scores except for the measure of interest in household activities where underachievers showed higher than the other group.

A noteworthy thing in the present study is that self sentiment factor of personality (O_3) did not significantly differentiate between the total sample and overachievers or total
sample and under-achievers, but did significantly differentiate between over- and under-achievers, over-and under-achievers at low and average level of intelligence. It again, did not differentiate between over- and under-achievers at high level of intelligence.

Undersachievers of high intelligence had higher mean score than the oversachievers of the same level of intelligence for the interest area of fine arts. Interest area of technical activities exhibited higher mean score for undersachievers (UAs) as compared to oversachievers (OAs).

In addition to the 'common' measures which differentiated between all the six pairs, or 'common' to three, four, or five pairs, or were 'specific' and differentiated between just one or two pairs of groups, thirteen measures (C, G, I, J, O, O₂, O₄, LIT, SC, MD, AG, OD and SP) did not significantly differentiate the mean differences between any of the above six pairs of groups.

The analysis of results based on Chapter VI as to the position of the behavioural and environmental correlates of academic achievement and over- and under-achievement with regard to the mean differences between the six pairs of groups in the present study leads to arrive at the following conclusions:

(1) Common correlates of academic achievement (TFS, OAs and UAs) and mean differences between the six pairs of groups.

Eleven behavioural and environment correlates* (SCA+, TA+, B+, O₂+, SHA, S₁AM+, S₂AM+, TAM+, FA-, HH-, SES+) were found to be common to all the three groups (TFS, OAs and UAs) that is,

* '+'' or '-' sign denotes the direction of correlation of the measure with the criterion.
all of them showed significant relationship with the criterion
and the relationship was found to be in the same direction for
all the three groups. Out of those eleven common correlates of
academic achievement in the three groups, seven of them were
the common behavioural and environmental measures (SCA, TA, B, SES,
SHA, S2AM, TAM) which showed significant mean differences be-
 tween all the six pairs of groups (TFS-OAs, TFS-UAAs, OAs-UAAs, OA1-UA1,
OA2-UA2 and OA3-UA3).

Three of them (O3+, S1AM+, HH) could also be considered
as common correlates which differentiated between at least four
out of the six pairs of groups. Say, for example, O3+ (high self-
sentiment) differentiated between the total final sample and over-
achievers (.10 level), over- and under-achievers, over- and under-ach-
hiers of low and average intelligence groups (.05 level). The
measure of achievement motivation expressed through scores on the
first story (S1AM) showed significant mean differences between all
the pairs except for the group of over- and under-achievers of low
level of intelligence, where the difference did not reach a level
of significance (t = 1.57). Similarly, for the measure of interest
in household activities, the mean differences for four of the
pairs were significant at either .05 or .01 level. For one group
(TFS-OAs), the significance level was .10. The mean differences
between the sixth pair of groups (OA2-UA2) were also in the same
direction as expected, though it did not reach a statistically
significant level of acceptance (t = -.816). So all these three
commom correlates may also be accepted as almost differentiating
between the six pairs of groups.
One common correlate (FA-) did not show any conspicuous differences between the means of the different pairs except between over- and under-achievers of high level of intelligence. Two more pairs, where it differentiated between the means of the two groups at .10 level of significance are those of total final sample and underachievers and over- and under-achievers. Although this measure is a common negative correlate of academic achievement, no mean differences in the rest of the different pairs of groups were observed.

The above results are the 'unique features' of the present study. Characteristic behavioural and environmental measures which were found to be the 'common' correlates of academic achievement, whether of the total group or any of the overskieving or under-achieving group, showed significant mean differences when compared with the total sample or over-and under-achieving groups, and these significant mean differences were also 'common' to over- and under-achievers when they were studied separately on the basis of levels of intelligence. Thus despite the fact that better school and total adjustment, higher scholastic mental capacity, higher self-concept control, better study habits and attitudes, higher achievement motivation (in all three measures), negative interest in fine arts and household activities and lastly, the better socio-economic status (eleven common correlates) are related with better academic achievement, whether of the total group or over- or under-achievers, yet overskiers obtained higher mean scores than the final group or the underskiers for positive correlates and vice versa for the negative correlates.
The common correlates of academic achievement of the total group, over- and under-achievers tend to be the common correlates of academic achievement of over- and under-achievers at low, average and high level of intelligence. The results of the present chapter confirm the fact that the mean differences which have been found significant within the bigger groups of the total sample, over- and under-achievers are also found to be significant in the truncated groups of over- and under-achievers at different levels of intelligence.

(ii) Common correlates of academic achievement of total group and oversachievers (TFS and OAs) and mean differences between the six pairs of groups.

Specific to the total group and the over-achievers better home and social adjustment (HA+ and SA+) were found to be correlates. So far as home adjustment is concerned, over-achievers significantly surpassed the mean scores of the total group or the undersachievers and the total group surpassed the mean scores of the undersachievers.

With regard to social adjustment, overachievers scored significantly higher means than the undersachievers or the total group in four out of the five pairs (three significant at .01 level and one at .10 level). No significant mean differences were observed between over- and under-achievers of low level of intelligence.
The common correlates of academic achievement specific to the total group and the undersachievers (TFS and UAs) and the mean differences between the six pairs of groups.

Two correlates specific to the above two groups are those of personality factor 'D-' (phlegmatic dimension) and negative interest in crafts (CR-). With regard to the personality factor 'D-', no significant mean differences between the six pairs of groups were observed except between over- and under-achievers of average level of intelligence. One pair that showed mean difference significant at .10 level is between over- and under-achievers. This measure did not differentiate between the total group and over- or under-achievers.

With regard to the correlate of negative interest in craft-centred activities, though it is not a significant correlate of oversachievers, yet when mean differences were studied, this measure showed significant mean differences between all the six pairs of groups, undersachievers always obtained higher mean score than the total group or the oversachievers.

The measures which did not correlate with academic achievement of any of the three groups (TFS, OAs and UAs) and the mean differences between the six pairs.

There were nine measures (C, J, O, Q, DIT, SC, MD, OD, SP) which did not correlate significantly with any of the three groups of total final sample, oversachievers or undersachievers at any level of significance. The mean differences for these measures between the six pairs of the groups showed that out of all these nine measures, not even a single measure differentiated between any of the six pairs of groups. Thus these were the
redundant measures which did not go with academic achievement or over- or under-achievement and which also did not significantly differentiate between these groups and the sub-groups. Results based on multivariate analysis, however, showed that when these seemingly ineffective measures interacted with the other measures, they led to contributing of variance in achievement. For example, measures of personality factor 'O' (untroubled adequacy-versus-guilt proneness), interest in scientific activities and sports contributed to the extent of 5.82 per cent of variance in achievement in the 'full model' of multivariate correlational analysis of the overachieving group. Factor analysis also confirms this fact. For example, personality Factors 'J' (vigorously-versus-doubting) and 'O' (untroubled adequacy-versus-guilt proneness) shared significant loadings with academic achievement in Factor VII for the underachieving group.

Four measures (C+, I-, O2+, G-) significantly correlated with the criterion of either the total group, or over- and under-achievers, and did not show significant mean differences between any of the six pairs of groups. This means that a correlate of academic achievement does not necessarily presume mean differences between different pairs of groups.

To sum up the discussion of the results of the present chapter, the behavioural and environmental measures of home, school and total adjustment, personality factor of crystallized intelligence, study habits and attitudes, measures of achievement motivation as expressed through second story and the total score, interest in craft centred activities and socio-economic status
(HA, SCA, TA, B, SHA, S2AM, TAM, CR, SES). Commonly and significantly differentiated between all the six pairs of groups.

The measure of (S1AM) showed significant mean differences between five out of the six pairs of groups. Besides, four measures significantly differentiated between the mean scores of four out of the six pairs of groups (HEA, H, C, MH).

Seven behavioural measures (A, D, E, F, Q3, FA, TECH) showed significant mean differences between less than four of the six pairs of groups.

Thirteen behavioural and environmental measures (C, G, I, J, O, O2, O4, LIT, SC, MD, AG, OD, SP) did not significantly differentiate between the means of any of the six pairs of groups. Out of them, nine measures (C, J, O, O4, LIT, SC, MD, OD, SP) did not significantly correlate with the achievement of any of the three main groups, that is, the total group, over- and under-achievers.

Out of the eleven 'common' behavioural and environmental correlates of academic achievement of the total group, over- and under-achievers, seven showed significant mean differences between all the six pairs of groups, one measure showed significant mean difference between four of the six pairs, and one showed significant mean difference only in one out of the six pairs of groups.

The two correlates of academic achievement were found specific to the total group and the oversachievers, one correlate (HA) differentiated between all the six pairs of groups and the other correlate (SA) differentiated between four of the six pairs of groups.
Out of the two correlates of academic achievement specific to the total group and the underachievers, one correlate (D-) differentiated between one out of the six pairs of groups and the other correlate (CR-) differentiated between all the six pairs of the groups.

These results thus, testify the hypothesis, namely, certain significant mean differences exist among the total final sample, total groups of over- and under-achievers and over- and under-achievers at three different levels of intelligence in respect of behavioural and environmental correlates of academic achievement. So much so that even those measures which are the common correlates of academic achievement of all the three major groups (TFS, OAs and UAs) or two of these groups, also show significant mean differences between different pairs of groups.

The mean profiles present a visual picture of these results. They show the mean position of the over- and under-achievers and over- and under-achievers at low, average and high level of intelligence when they are compared with the total group (TFS).