PERSONALITY PATTERNS OF OVER AND UNDER ACHIEVING SCIENCE STUDENTS AT P.U.C. LEVEL

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CHAPTER I

INTRODUCTION
INTRODUCTION

Education is sine qua non for the progress and prosperity of a nation. A nation can not progress unless it makes effective use of the talents of its citizens. This would necessitate that the education should be provided according to the individual differences in the talents of its citizens. The Secondary Education Commission (1953) also writes, "......... Our secondary school should no longer be 'single track' institutions but should offer a diversity of educational programmes calculated to meet varying aptitudes, interests and talents......."

Different States in India have, therefore, introduced diversified courses that is the courses suitable for different types of talents at the High School or the Higher Secondary stage. But the admission to these diversified courses is more often than not, determined not by the talents of the child but by the glamour of the future prospects that some of the courses seem
to have in store for the students. This results in a large scale wastage in the form of failure and under achievement.

Table 1.1 presents the division wise results of Intermediate examination of students belonging to different streams of courses in Intermediate College of Aligarh city.
DIVISION WISE RESULT OF INTERMEDIATE EXAMINATION 1980
OF STUDENTS (BOYS AND GIRLS) BELONGING TO LITERARY,
SCIENTIFIC, AND COMMERCIAL STREAMS OF NINE INTERMEDIATE
COLLEGES OF ALIGARH CITY*

<table>
<thead>
<tr>
<th>Streams</th>
<th>Sex</th>
<th>N</th>
<th>First Division</th>
<th>Second Division</th>
<th>Third Division</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literary</td>
<td>Boys</td>
<td>476</td>
<td>0.00</td>
<td>12.18</td>
<td>31.52</td>
<td>43.70</td>
<td>56.30</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>449</td>
<td>2.89</td>
<td>52.14</td>
<td>14.92</td>
<td>39.95</td>
<td>30.05</td>
</tr>
<tr>
<td></td>
<td>Combi-</td>
<td>925</td>
<td>1.41</td>
<td>31.57</td>
<td>23.57</td>
<td>56.43</td>
<td>43.57</td>
</tr>
<tr>
<td>Scientific</td>
<td>Boys</td>
<td>391</td>
<td>4.09</td>
<td>30.43</td>
<td>17.14</td>
<td>51.65</td>
<td>48.34</td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>52</td>
<td>19.23</td>
<td>61.54</td>
<td>7.69</td>
<td>88.46</td>
<td>11.54</td>
</tr>
<tr>
<td></td>
<td>Combi-</td>
<td>443</td>
<td>5.87</td>
<td>34.09</td>
<td>16.02</td>
<td>55.98</td>
<td>44.02</td>
</tr>
<tr>
<td>Commercial</td>
<td>Boys</td>
<td>397</td>
<td>3.02</td>
<td>39.29</td>
<td>23.68</td>
<td>65.99</td>
<td>34.01</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,765</td>
<td>2.89</td>
<td>33.94</td>
<td>21.64</td>
<td>58.47</td>
<td>41.53</td>
</tr>
</tbody>
</table>

Table 1.1 reveals that 43.57% students failed in the literary stream, 44.02 in the scientific stream and 34.01% in the commercial stream. Thus the

percentage of failure is highest in the scientific stream. To this figure one can easily add the percentage of those who failed to secure a first or second division i.e. who secured a third division. The students who could secure only a third division are no better than the failures as far as the employment potential or admission to higher courses is concerned. Thus more, than 60% students (Boys and Girls) either failed or secured a third division in the scientific stream. The table also reveals that 43.57% students failed in the literary stream and 23.45% students secured a third division. Thus 67.02% students in the literary stream either failed or secured a third division. Similarly 34.01% students failed in the commercial stream and 23.68% secured a third division making a total of 57.69% of students who secured a third division or failed in the commercial stream. On an average 41.53% students failed and 21.64 students secured a third division i.e. 63.17% students either failed or secured a third division.

It will be recalled that these figures are for the city of Aligarh where because of its old educational traditions and academic facilities the standard can be expected to be a little better than in the other parts of the Uttar Pradesh. Since similar data for the other parts of Uttar
Pradesh, was not available, the investigator than to base her conclusion on this data alone. This figure of 63.17% average wastage at the Higher Secondary stage is alarming. Particularly in view of the per capita expenditure incurred at this stage.

The per capita expenditure on the students at the higher secondary level as estimated by Education Commission (1966) in the year 1965-66 was Rs. 107. In view of the increase in the price index, this estimate comes to Rs. 617 approximately in the year 1980. 4,95,623 students were on rolls at the higher secondary (Intermediate) level in Uttar Pradesh only in the year 1980. With an estimated 63 percent students failing or securing a low division. The number of such students came to 3,12,242. Thus the nation suffers a loss of Rs. 19,253314 approximately at the higher secondary stage in the State of Uttar Pradesh only. The total loss for the whole of the nation would be colossal.

This colossal wastage should not be accounted for in terms of money alone. This also

* Ibid.
affects the personality of the child adversely and his future achievement motivation suffers a serious jolt which further aggravates the situation. A developing nation like ours can not afford to waste this important human material.

This wastage can be due to a variety of causes e.g. selection of courses not in accordance with the talents of the children, improper teaching and lack of facilities in the schools and homes of the pupils. Of these, selection of courses not according to the talents of the child seems to be one of the most important causes of wastes Kulshrestha (1956) is also of this view. While emphasising the importance of guidance to such students, he writes, "Giving proper education guidance to the entrants of the higher secondary education, has been emphasised not only to save huge amounts of public money being wasted in frequent changes of a subject or a subject groups by students making choices which do not fit in with their genius." Thus if we want to avoid this colossal wastage of man power resource, every effort should be made to select students for the different courses according to their talents.

Selection of students according
to their talents is also imperative due to another reason. Consequent to the population explosion the number of students seeking admission to the educational institution is increasing at a very high rate. In span of hardly 30 years the total number of High School and Higher Secondary school in the country has increased from 7,288 in 1950-51 to 464730 in 1978 and increase of more than six time. The number of students in these institutions has increased from 6.33 millions in 1969-70 to 6.32 millions in 1978-79. Thus there has been a tremendous increase in the number of students seeking admission to higher secondary schools. This number is likely to increase to enormous proportion. Since our schools are already over crowded this would need selective admission. Selection of students on the basis of their talents seems to be the best criteria of selection. Therefore effort should be made to identify the intellectual and personality characteristics of the students who are likely to achieve high in different stream of courses.

The Secondary Education Commission (1953) had recommended the diversification of courses at

the start of class IX. Later on it was considered that the capabilities and potentialities of students are not likely to crystalise at the start of class IX, the diversification should be postponed to a later date. Kothari Commission (1966) is also of this view, they write, ".. ... the system of 'streaming' in schools of general education, which now begins in class IX, should be given up and no attempt at specialisation should be made till after class X."

Thus according to the recommendations of Kothari Commission the new pattern of education for the whole of India would consist of ten years of general education followed by diversification after class XI. Thus the students would be required to select courses suited to their talents at the XI class stage.

Selection of courses suited to the talents of students at XI class stage would require an extensive study of the intellectual and personality characteristic of the students who secure high in the different streams of courses. Quite a few studies have been conducted to investigate the relationship of intellectual and personality characteristics of students with
over all achievement without any reference to the streams of courses offered (Sinha, 1965; Verma, 1966; Bhatnagar, 1968; Dhalliwal, 1971; Pathak, 1972; Srivastava, 1974; Ameerjan, Girija and Bhadra, 1978 and Gupta, 1979).

Some researchers have, however, attempted at differential prediction i.e., prediction of achievement indifferent streams of courses but they have restricted their study to intellectual characteristics only. Kulshrestha (1956) found that students studying in scientific stream of courses possess a higher level of intelligence as compared to those studying in literary and commercial streams but Mehdi (1966) casts serious doubts on such a finding. Apart from the inconsistent results of these studies, these investigators also seem to suffer from some defects in their research designs. Factors other than those included in these investigations may also affect the relationships studied. Factors like anxiety, study habits and socio economic status have been found to influence academic achievement to an appreciable degree. Such factors should have been controlled in these investigations.
Personality is as important as intellect in determining academic achievement. The intellect determines that the persons would be able to achieve or not but the personality determines whether that person would achieve it or not. Thus there is a need to undertake study of differential prediction of personality characteristics. The present study, therefore, seeks to identify personality characteristics of students (boys and girls) who secure high in the scientific stream of course.

**Statement of the problem**

In specific terms, the present study seeks to identify the personality characteristics of over and under achieving students (boys and girls) studying in scientific stream pre-University class of Aligarh Muslim University, Aligarh.

**Procedure in outline**

Deva's 12 P.F. Inventory was administered to one hundred boys and one hundred girls studying in science courses in pre-University class of
Aligarh Muslim University, Aligarh. A suitable composite of marks obtained by these students in three subjects, physics, chemistry and mathematics constituted the criterion measure. Jalota's test of General Mental Ability constituted the measure for controlling intelligence. Thorndike's (1963) concepts of over and under achievement was employed for controlling the effect of intelligence on achievement. Thorndike defines over and under achievement as discrepancy between actual achievement and that predicted on the basis of regression equation between the intelligence and actual achievement.

25 over and 25 under achievers were identified from the boys and girls separately. Significance of difference between the means of the scores on 12 personality factors obtained by over and under achieving boys and girls separately, as also between over achieving girls and boys and under achieving girls and boys was estimated by employing 't' test.

DELIMITATIONS

(1) The study is confined to students studying in pre university class of Aligarh
Muslim University, Aligarh. Therefore the extent to which the results of the present study may be generalised will depend on the similarity of the students population in question and that investigated.

(2) The students at the higher secondary stage may offer a variety of streams like scientific, literary, commercial, aesthetic and constructive etc. The present study is confined to the study of personality characteristics of students in the scientific stream only.

(3) There is a variety of personality factors like those of temperament, adjustment and attitude that can be investigated for their effect on achievement. The present study has however, employed the 12 factors of Deva's Personality Inventory for this purpose.

(4) A variety of intellectual and personality characteristic influence academic achievement e.g. intelligence, creativity, different factors of temperament, achievement motivation etc. Some of them can be employed for the purposes of controls.
Intelligence has been found to be one of the single most important factor in this regard. The present study thus therefore, employed intelligence for this purpose.

(5) A variety of statistical procedures can be employed for eliminating the effect of control variables on achievement. They include analysis of variance and covariance, coefficient of partial correlation etc. The present study has, however, employed Thorndike's concept of over and under achievement for controlling the effect of intelligence on achievement.

(6) The review of related research has revealed that a variety of statistical procedure has been employed for establishing the predictive validity of the different personality characteristics for achievement. These procedures include coefficient of multiple correlation, Chi Square test, 't' test etc. Because of the difficulties involved in the satisfaction of the basic assumptions essential for the legitimate use of some of these statistical techniques, the present study has employed the 't' test for this purpose.
The unprecedent rush for enrolment to schools and colleges, limited resources, alarming figures of wastage and consequent loss of a very colossal magnitude make it urgently necessary that only those students should be admitted to different courses of study at the higher secondary level who may be most useful for the nations' welfare. This would require selective admissions.

The present study is likely to identify the personality characteristics of over and under achieving boys and girls in the scientific streams. Thus it may be of help in making admissions on an empirical basis.
REFERENCES


CHAPTER II

REVIEW OF PREVIOUS RESEARCHES
REVIEW OF PREVIOUS RESEARCHES

The present study aims at identifying the personality characteristics of students achieving high and low in the scientific stream at the higher secondary level. As pointed out in the preceding chapter efforts have already been made for establishing predictive validity of different personality factors for overall achievement and little or no efforts seems to have been made at differential prediction or prediction of academic achievement in the different streams. However, a review of the studies predicting overall achievement is likely to help in designing the present study in this regard.

Such a view will also help in identifying intellectual and personality factors which affects academic achievement to an appreciable degree and consequently can be employed as control variables. The present chapter, therefore, presents a review of studies which have attempted to investigate the relationship between different intellectual and personality
characteristics and academic achievement.

**PERSONALITY AND ACADEMIC ACHIEVEMENT**

Personality seems to play a very significant role in academic achievement. A number of research workers have attempted to study the relationship between different personality factors and overall academic achievement. The personality factors that have been frequently studied include anxiety, introversion, extraversion, neuroticism. A review of these studies is presented below.

**ANXIETY AND ACADEMIC ACHIEVEMENT**

Anxiety is the manifestation of some present and future threats as perceived by the individual. Therefore, it plays a very prominent role in all the walks of life let alone academic achievement. An anxious student cannot achieve high even though he possesses a high level of intelligence. Research workers have therefore, employed anxiety as one of the important predictors of academic achievement. Some of the well-known studies investigating the relationship between anxiety and academic achievement are presented below.
Stern, Stein and Bloom (1956) after a study of the relationship between anxiety and academic achievement concluded that highly anxious students tended to achieve low on measures of academic achievements. Dennis (1964) also attempted to investigate the relationship between anxiety and academic achievement. The sample of the study consisted of 138 students, covering the age range of eleven to fifteen years. Sarason's General Anxiety Scale for children was used as a measure of anxiety. Personality dimension of introversion-extraversion was employed as a control variable. The means of high anxiety extraverts and low anxiety extraverts were found to be 1.29 and 2.41 respectively. Similarly the means of high anxiety introverts and low anxiety introverts were 2.16 and 2.61 respectively. Their results show clearly that students possessing a high level of anxiety achieve less than the students of low level of anxiety.

Knight and Sarsenrath (1966), however, concluded that high anxiety students worked faster and more with fewer errors and thus achieved higher than low anxiety students. Sarason (1957) and Biggs (1959) have also obtained positive and significant
relationship between anxiety and academic achievement.

The relationship between anxiety and academic achievement has also been studied by some Indian investigators, Sinha (1965) conducted a study to find out the relationship between anxiety and academic achievement at University level. A sample of 185 high achievers and 190 low achievers was selected on the basis of last University examination marks. Sinha's Anxiety Scale and examination marks was employed to measure anxiety and achievement respectively. It was found that low achievers were significantly more anxious than the high achievers. Fatehpuria (1965) attempted to investigate the effect of anxiety on academic achievement. He found that high anxiety was a positive source of scholastic backwardness of the children. Dhaliwal (1971) conducted a study to find out the anxiety level of successful and failing students. He selected 837 students of X grade from 12 high schools for the sample of his main study. Sinha's W.A. Self Analysis form was employed to measure anxiety. Examination marks served as measures of academic achievement. The coefficient of product moment correlation eta coefficient and F test were employed to find out the relationship. The correlation between anxiety and academic over-under achievement was -.110 which is low but significant, shows that there is a negative relationship
between the two variables, implying thereby that the greater the anxiety the less is the actual achievement as compared to the potential achievement and vice versa. The eta coefficient between academic over under achievement and anxiety was -.241 which, significantly greater than the product moment coefficient of correlation, which indicates that there is a curvilinear relationship between the two variables, implying that low anxiety goes with the actual achievement, whereas high anxiety corresponds to both over and underachievement. It may be concluded that of the level of anxiety is lower than a certain minimum, it will neither have a facilitating nor a harmful effect on academic achievement, with the result that the actual achievement will neither rise above nor fall below the expected achievement and that an increase in anxiety above this level of minimum will go with a corresponding increase in the actual achievement as compared with the potential achievement up to a certain extent beyond which any further increase in anxiety will correspond with a decrease in the actual achievement as compared with the potential achievement.

A review of the researches conducted to investigate the relationship between anxiety and achievement
reveals that the results are inconsistent. Stern, Stein and Bloom (1956), Dennis (1964), Sinha (1965), and Fatehpuria (1966) obtained a negative relationship between anxiety and achievement but Knight and Sarsenrath (1966) Sarason (1957) and Biggs (1959) obtained a positive relationship between these variables. Dhaiwal (1971) obtained a curvilinear relationship between anxiety and academic achievement.

**INTRAVERSION-EXTRAVERSION AND ACADEMIC ACHIEVEMENT**

Intraversion, Extra version is an important personality dimension and is likely to influence achievement to a fair degree. Furneaux (1956) and Broad bent (1958) found that high achievers among University students were a significantly more introverted than low achievers. Dennis (1964) attempted to find out the relationship between introversion extra version and academic achievement. His sample consisted of 138 children from urban comprehensive school and 40 boys from a public school. The Junior Maudslay Personality Inventory and school examination marks served as measuring tools. The investigator found that there was a positive relationship between introversion and achievement in school examination. Finlayson (1970) attempted to find out the relationship between introversion-extraversion and the school achievement.
The sample consisted of 128 boys at the ages of 12, 13, 14 in a grammar school. The Junior Edwards Personality Inventory (JEPI) was employed to measure personality. The sample was divided into four groups of high and low neurotic introverts and extraverts according to their scores on the JEPI. Each group consisted of 32 boys. The subjects scores on the standard English (EQ) and Arithmetic (AQ) test in the 'Eleven Plus' examination served as measure of academic achievement. The study revealed that there were significant differences in academic achievement between introverts and extraverts.

At the end of the first year at Grammar School, some differences in performances began to emerge. There were no statistically significant differences in performance, but the mean scores for the first year examination distinctly favoured the introverts. Sinha (1967) hypothesised that the high and low achievers would differ significantly in respect of their introversion and extraversion. The sample consisted of 400 male students (200 high and 200 low) studying in class X in Bihar. The Eysenck Personality Inventory and the aggregate of marks of two consecutive examinations were employed as measures of personality and academic achievement respectively. The study revealed that the two groups were significantly discriminated.
beyond 0.01 level) on introversion-extraversion. Vidhu (1968) attempted to find out the relationship between extraversion-intraversion and achievement. 300 students proficient in English as well as in Hindi, mostly from classes VIII to X were selected for the sample of the study. The students were divided into three sub groups, each consisting of 50 boys and 50 girls. The Junior Personality Inventory for the first group and the Maudslay Personality Inventory for second and third groups were employed to measure personality. The study showed that introversion and achievement were positively associated.

A review of the studies attempting to investigate the relationship between the personality dimension extraversion-intraversion and academic achievement has been presented in the preceding paragraphs. A perusal of these studies reveals that introverts have found to achieve higher than extraverts in most of the studies.

NEUROTICISM AND ACADEMIC ACHIEVEMENT

The relationship between neuroticism and academic achievement has been studied by a fairly sufficient number of investigators. Savage (1962) attempted to investigate the relationship between some personality factors including neuroticism and academic performance. His sample consisted
of 168 male and female students entering the Arts Faculty of New England University in 1959, 1960 and 1961. The Maudslay Personality Inventory was employed to measure personality factors including neuroticism. A correlation of -.9 was obtained between mean neuroticism scores for each group and academic success. Rao (1963) conducted a study to find out the role of personality aspects in scholastic performance. 305 students were selected for the sample of the study. The sample was divided into three groups viz., over, under and normal achievers in the professional (engineering) and non-professional (Arts and science) courses. The Sri Venketeswara University Personality scale was employed to measure factors of personality including neuroticism. The study revealed that the achievement was negatively but significantly related to neurotic difficulties. Savage (1966) in another study attempted to investigate the relationship between personality factors including neuroticism and achievement of Junior school children. The Junior Maudslay Personality Inventory (JMPI) and marks in reading and arithmetic were employed as measures of personality and academic achievement respectively. The correlation of -0.22 significant at .05 level was obtained between neuroticism and reading scores. Basu (1970) hypothesised that the higher
the academic success of the students, the lower the neuroticism core. A sample from secondary school students in Bengal was selected for the study. The Maudslay Personality Inventory and result obtained in annual examination were employed to measure the variables. The study revealed that there was a correlation - .9 between neuroticism score a for each group and academic success.

The studies reviewed above have obtained a negative and significant relationship between neuroticism and academic achievement. But Furneaux (1956) Broadbent (1958) and Upmanyu (1974) obtained a positive relationship between neuroticism and academic achievement.

MENTAL HEALTH AND ACADEMIC ACHIEVEMENT

Student's mental health seems to be an important variable affecting their achievement. Quite a large number of studies have been conducted to investigate this relationship. Some of the well-known studies have been reviewed below. Srivastava (1967) attempted to investigate the relationship between adjustment and achievement. The average examination marks spread over six consecutive examinations served as criterion variable. The study revealed that under achievement was related to poor social and emotional adjustment.
Dhaliwal (1971) also attempted to investigate the relationship between adjustment and over and under achievement. He employed Vyaktitva Parakh Prashnavali constructed and standardised by Saxena as measure of adjustment. The over and under achievers were identified, on the basis of achievement and intelligence scores. It was found that the over achievers and the under achievers do not significantly differ from each other in their level of adjustment, but the normal achievers appear to be significantly more adjusted than the two extreme groups. Thus both under and over achievers do not seem to be well adjusted. The study also shows that adjustment bears a curvilinear relationship with achievement.

Saxena (1972) conducted a comprehensive study to find out the adjustment of over and under achievers. His sample consisted of 1769 boys of XI class. The over, normal and under achievers were identified on the basis of the discrepancy between the actual and the predicted scores, prediction on the basis of regression equation between intelligence and actual achievement employed to measure adjustment. The investigator found that over achieving students had a consistently and significantly lower number of problems of adjustment in the various areas measured than the under achievers. Under achievers were burdened by a greater number of problems in general.
The studies reviewed in the preceding paragraphs reveal that adjustment plays a very important role in academic achievement. Almost all investigators in the area have found that well-adjusted students tend to attain high and vice-versa but Dhaliwal (1971) obtained a curvilinear relationship between adjustment and academic achievement. The high as well as the low achievers in his study tended to be poorly adjusted and the students found to be well adjusted. Singh's (1965) findings are not in agreement with those of other investigators in the area. He found that while health and home adjustment tended to be positively associated with academic achievement, social adjustment tended to be negatively associated with academic achievement.

**PERSONALITY FACTORS AND ACADEMIC ACHIEVEMENT**

Dhaliwal (1971) tried to investigate the relationship of certain personality factors with over and under achievement. He found that over achievement goes with reservedness, high verbal ability, emotional stability, obedience and sobriety, while under achievement goes with opposite tendencies of outgoing traits, low verbal ability, emotional instability, and happy go-lucky dis-
position. Lavin (1965) attempted to list the personality variables which have tended to be associated with higher level of performance. The table below presents a list of personality variables associated with high academic performance.

**Table I.**

Listing of Personality Variables Association with Higher Level of Academic Performance -

1. higher achievement motivation
2. higher need for order
3. more endurance
4. greater socialization
5. greater social presence
6. greater femininity
7. higher conformance
8. greater curiosity
9. greater independence
10. greater flexibility
11. greater originality
12. greater social maturity
13. moderate impulsivity (lack of constrictedness)
14. greater ability to visualize a configuration when move
15. move relevant thinking in the classroom
Fatima (1972) conducted a study to investigate the relationship between personality patterns and achievement. She attempted to control the effect of intelligence by dividing the subjects into high, low, and medium intelligence and academic achievement groups. She found that high achievers possessed a personality pattern which differed significantly from that of the low achievers. The high achievers were found to be reserved, more intelligent, assertive, conscientious, venturesome, self-sufficient and controlled, whereas the low achievers tended to be outgoing, less intelligent, obedient, undisciplined, self-conflicted.
Gebhart and Hoyt (1958) designed a study to investigate some personality correlated of over-under achievement. The major purpose of their study was to see whether under achieving and over achieving students differed in terms of personality needs. Their study used the scores on the Edwards Personal Preference Schedule as the measure of different personality needs. For the identification of over achievers and under achievers based on relationship between intelligence and achievement were employed. It was found that overachievers scored significantly higher on the scales of personality needs of achievement, order, intraception and consistency whereas underachievers scored significantly higher on the scales of nurturance, affiliation, and change. As regards differences in personality needs of the groups formed on the basis of ability levels, the study discovered that high ability groups scored consistently and significantly higher on the achievement, exhibition, autonomy, dominance and consistency scales, whereas the low ability groups scored consistently and significantly higher on the variables of deference, order, abasement & nurturance.
Need achievement has been considered as one of the important predictors of academic achievement. Bhatnagar (1969) attempted to investigate the relationship between need achievement and academic achievement. 1,941 students of class X of arts, science and commerce courses from 29 schools of Rajasthan were selected randomly for the sample of the study. The Edward’s Personal Preference Schedule (hindi) and scores on attainment test in hindi, general science, elementary, arithmetic and social studies were employed as measuring tools of need achievement and academic performance respectively. A correlation of .38 significant at .001 level was obtained between need achievement and academic performance. Ruhland, Gold and Feld (1978) conducted a study to find out the relationship between need achievement and scholastic performance of 154 II or V grade children. The investigator concluded a positive relationship between need achievement and scholastic performance.

Sinha, Knight and Sarsenrath (1966) in a study with 139 undergraduate pupils showed that high achievement motivated students learnt more efficiently than low achieve-
ment motivated students on all the three measures of achievement immediate, retention and transfer learning scores.

The studies reviewed above reveal that need achievement is positively and significantly associated with academic achievement. Some have however, obtained insignificant relationship between achievement motivation or need achievement and academic achievement. Doty and Doty (1964) attempted to investigate the relationship between need achievement and academic achievement. The sample consisted to 100 college undergraduates, Edwards Personal Preference Schedule served as a measure of achievement motivation. The data did not reveal any statistically significant relationship. Sinha (1965) after a study 185 high achievers and 190 low achievers concluded that they did not differ in their achievement motivation.

Dhaliwal (1971) obtained a curvilinear relationship between need achievement and academic achievement, with 887 students of X grade. He found that over and under achievement go with higher need achievement. The insignificant values obtained by Doty and Doty (1964) and Sinha (1965) may be due to this curvilinear relation-
ship between need achievement and academic achievement.

**STUDY HABITS AND ACADEMIC ACHIEVEMENT**

Habits of study play an important role in level of academic achievement. Students with good study habits are likely to achieve high and vice versa. Improvement of study habits not only helps in the promotion of better work but also influences students' morale and sense of satisfaction, which further helps him to achieve higher. Quite a few research workers have, therefore, attempted to study the relationship between study habits and academic achievement. After a fairly exhaustive study Young (1952) concluded that study habits play a very significant role in academic achievement.

Verma (1966) conducted a comprehensive study to find out the relationship between study habits and academic achievement. 515 students of grade X studying science, humanities and commerce courses in the institution of eastern districts of Uttar Pradesh served as the sample of the study. The investigation revealed that students possessing good study habits tended to secure better marks as compared to those possessing poor study habits.
Srivastava (1967) also attempted to identify the causes of underachievement of 1,837 male pupils, studying in class X and XI in nine secondary schools of a district in Bihar. A study habit inventory constructed by the investigator and average examination marks spread over six consecutive examinations were employed to measure study habits and achievement respectively. The investigation revealed that poor study habits were one of the main causes for underachievement.

Jha (1970) employed Wrenn’s Study Habit Inventory and the average of marks obtained at two preceding annual examinations in science served as measures of study habit and achievement respectively. The study revealed that there was a significant and positive relationship between achievement in science and study habits in the case of boys and combined samples but not so in the case of girls.

Mehdi (1965) after a very exhaustive study to find out the effect of study habits on academic performance. He concluded that the study habits were not significantly related to academic achievement.

The studies reviewed above show that study habits
play a significant role in prediction of academic performance. However, Mehdi (1965) could not obtain a significant relationship between these variables. Tha (1970) also could not obtain significant relationship between study habits and achievement in case girls only.

**Socio Economic Status and Academic Achievement**

The socio economic status of the family in which the child has been reared is likely to influence his academic achievement. A sufficient number of investigators have attempted to study the relationship between socio economic status and academic achievement and have obtained significant relationship between the two variables. (Terman, 1947; Miner, 1957; Shaw, 1958; & Frankel, 1960)

Some studies investigating the relationship between socio economic status and academic achievement conducted in India have also obtained significant relationships. Verma (1966) conducted a comprehensive study to investigate the relationship of socio economic status with achievement. The study consisted of the sample of 115 students, studying in class X, representing science, humanities and commerce courses from the secondary instit-
tutions of eastern Uttar Pradesh. The investigation revealed that successful students had better socio economic status.

Pathak (1972) also attempted to find out the importance of socio economic status in determining the high and low academic achievement. He selected a sample consisting of 105 high and 100 low achievers from 1,910 science students studying in class X of eleven higher secondary schools in Rajasthan. A Socio Economic Blank and an achievement test in science developed by the investigator served as measuring tools. The study revealed that overall socio economic status of high achievers was significantly higher and the high achievers were found mostly from the top three occupational categories, i.e. professional, semi professional, and clerical.

A review of the studies investigating the relationship between academic achievement and socio economic status show that socio economic status plays a significant role in the academic achievement of the students.

**Intelligence and Academic Achievement**

Intelligence plays a very prominent role in determining academic achievement. Dhaliwal (1971) also
Intelligence is the single important factor accounting for variation in academic achievement, that it plays a major role in causing difference among individuals regarding their academic achievement. A large number of studies have been attempted to investigate the relationship between intelligence and academic achievement. 

Stephens (1960) attempted to investigate the relationship between intelligence and academic performance. He computed Pearson's product moment coefficient of correlation between reliable measures of the two variables and obtained values of correlation ranging from 0.1 to 0.9. Silberman and others (1961) found that there was a definite and significant relationship between measured intelligence and amount of learning when high school students were taught logical relationship with a 400 item performance using multiple choice answers.

Scott (1963) conducted a fairly comprehensive study to investigate the relationship between intelligence and academic success in different subject matter areas. 670 students studying reading, arithmetic, social studies and science courses in a public school, comprised the subjects of the study Pearson's product moment coefficient.
of correlation were computed between the measures of intelligence and grade point averages, in the different subject matter areas. The values obtained for the various subject matter areas ranged from .239 to .358. The study thus reveals that intelligence is a fairly important predictor of academic achievement.

The above mentioned studies clearly show that intelligence plays a very important role in predicting academic achievement in different subject matter areas. The studies conducted in India have also borne similar results. A review of such studies is presented below.

Verma (1960) conducted a study to find out the predictive value of intelligence for school performance. The sample consisted of 112 boys studying in high school class of the Board of the High School and Intermediate Education, Uttar Pradesh. The Verbal Group Intelligence Test (Hindi) served as a measure of intelligence and half-yearly examination marks were employed as criterion measure. The study revealed that intelligence is an important variable for predicting academic achievement.

Sinha (1965) attempted to identify intellectual factors associated with the performance of the students at the University level. A sample of 185 high and 190 low
achievers on the basis of the last University examination marks was selected and Mohsin's "Bihar Test of General Intelligence" was employed as a measure of intelligence. The investigation revealed that in their intellectual capacity the more successful students were significantly superior with a mean I.Q of 112.98 as against that of 102.49 of the low achievers. The high achievers were found to be superior on cognitive intellectual abilities. Dhaliwal (1971) attempted to investigate the relationship between academic achievement and intelligence. The study was conducted in two phases, a pilot study on a sample of 887 students. A Product moment coefficient of correlation of .523 and .530 were obtained for the pilot and the main studies respectively. Both the values are highly significant.

The review presented above shows that intelligence is a very important variable for predicting academic achievement.

CREATIVITY AND ACADEMIC ACHIEVEMENT

Creativity is relatively a new field of research and has not yet been investigated as much as other fields. There has been a great spurt in the efforts to measure
creativity and to investigate the relationship with other variables during the last two decades.

Getzels and Jackson (1962) attempted to compare the achievement of two groups of adolescents, one representing individuals very high in intelligence but not as high in creativity and the other representing individuals very high in creativity but not as high in intelligence. The level of intelligence of the high intelligence group was 23 points higher than that of high creativity group, yet they were equal on academic achievement measure. This shows that creativity also plays a significant role in academic achievement.

Mehdi (1977) also reports that a number of investigators have obtained a significant and positive relationship between creativity and measures of achievement. Kumar (1978) concluded that the high creatives are more achievement motivated than the low creatives.

The above review clearly indicated that creativity plays an important role in academic achievement. It is considered as one of the main predictors of achieve-
ment. However, there have been some researches which could not obtain a significant relationship between the two variables.

Thorndike (1963) conducted a study to find out the relationship between creativity and measures of academic achievement. He obtained a low relationship between the two variables. Flescher (1963) conducted a study to find out the relationship between creativity and scholastic achievement, but could not obtain any significant relationship between them. Dhaliwal (1976) also reports insignificant relationship between creativity and academic achievement with intelligence held constant.
References


CHAPTER III

DESIGN OF THE STUDY
DESIGN OF THE STUDY

The objective of the present study is to identify the personality characteristics of boys and girls achieving high and low in science stream at the higher secondary level. Such a study would obviously require identification of groups of high and low achievers, selection of suitable measures of personality and academic achievement and a suitable statistical technique. The description of these pre-requisites of the investigation has been presented in the following paragraphs.

IDENTIFICATION OF HIGH AND LOW ACHIEVERS

A review of previous research has revealed that variety of procedures have been adopted for identifying high and low achievers. Most of the studies have identified high and low achievers by arranging the students in either ascending or descending order of academic achievement and selecting the high achievers from the two ends of this continuum. This selection has been made either on the basis of percentages e.g. 30% of the top constituting the high achievers and 30%
of the bottom constituting the low achievers. Some have designated students above 75 the percentile or third quartile as high achievers and those below of the 25th percentile or first quartile as low achievers. Others have employed standard deviation for this purpose: Students beyond one standard deviation above the mean served as high achievers and below one standard deviation below the mean served as low achievers.

These procedures of identifying high and low achievers do not take into account the role of intelligence in influencing academic achievement. It studies like the present one which attempts to identify the personality characteristics of students achieving high and low, intelligence should be controlled so that only the effect of the personality characteristics can be investigated. This can be achieved by either eliminating the effect of intelligence by employing techniques like partial correlation analysis of variance and covariance or identifying over and under achievers with respect to their intelligence.

A review of previous researches presented in chapter two has clearly shown that intelligence plays a very prominent role in determining achievement. Therefore, this variable has been employed for identifying over and
under achievers in most of the studies, these studies have employed different techniques and procedures for this purpose.

Two methods are possible for neutralising the effect of intelligence on achievement, one is the normative approach advocated by Edginton (1964) in which norms of achievement are set up for different levels of intelligence and contrasting groups of "over achievers" and "Under achievers" are formed by drawing subjects with high and low achievement respectively from each level of intelligence. The other method suggested by Thorndike (1963) consists in first of all, setting up the standard of expected achievement by transforming the intelligence score into a measure of predicted achievement on the basis of functional relationship between intelligence and academic achievement and then to work out discrepancies between the predicted achievement and actual achievement. The positive discrepancies representing over achievement and negative discrepancies under achievement. In the present investigation the second method was preferred to the first. Dhaliwal (1977) has given the following reasons for this.
1. The normative method is relevant only to the use of extreme groups, design, whereas the method employing regression equation for setting up measures of predicted achievement and working out discrepancies between predicted achievement and actual achievement yields a continuum of indices for over-under achievement, which are amenable to both the contrast group and correlational treatments.

2. The normative method does not take into account whether and to what extent intelligence and achievement are correlated so that no empirical justification is possible for using intelligence as a basis for locating over and under achievement and consequently, for equating or neutralising its effect on achievement.

The second method suggested by Thorndike is preferable to the first in so far as it employs empirically determined index of functional relationship between intelligence and achievement for transforming intelligence scores into scores for predicted achievement.

Theoretically the terms over achievement and under achievement are relevant and meaningful only in
comparison with some standard of achievement predicted or expected. In the present investigation, optimal prediction of academic performance is obtained by "regression equation" in which the measure of intelligence has been employed as a predictor and the degree of correlation between intelligence and academic achievement as the coefficient of predictive validity of the measure of intelligence.

Symbolically, the regression equation, in score form used for predicting the measure of achievement from the knowledge of the measure of intelligence is as follows:

\[ Y' = r \frac{\sigma_Y}{\sigma_X} (X - M_X) + My \]

Where  
\( Y' \) = The predicted value of the dependent variable (i.e., achievement).

\( r_Y \) = The coefficient of correlation between the intelligence and the criterion variables.

\( X \) = The score on intelligence test (Predictor test)
$M_x = \text{Mean of the predictor scores of the sample of subjects.}$

$M_y = \text{Mean of Criterion scores (i.e. achievement measures, used as dependent variable) of the sample of subjects.}$

$\sigma_Y = \text{Standard deviation of predicted scores.}$

$\sigma_X = \text{Standard deviation of criterion scores.}$

The above regression equation will enable the transformation of intelligence score of a student into a score of predicted achievement. If the actual achievement of a student is more than one predicted achievement, predicted on the basis of the above regression equation, the student is called an over achiever. If his actual achievement is less than the predicted achievement the student will be called an under achiever.

The identification of over and under achiever on the basis of above regression equation would necessitate a measure of intelligence and a measure of academic
Students identified as over and under achieving would then be studied for differences in their personality. If the differences for a personality characteristics are significant, that personality factor can be considered important for the purposes of educational guidance. The measures of intelligence achievement and personality factors employed in this study are presented below.

MEASURE OF INTELLIGENCE

The Group Test of General Mental Ability

The Group Test of General Mental Ability, hereinafter called as GTMA, consists of one hundred test items which are of the following types.

1. Vocabulary - Similar
2. Vocabulary - Opposite
3. Number - Series
4. Classification
5. Test - Answer
6. Inferences and
7. Analogies.

The items in the test have been arranged according to their difficulty. It is a speed test and
twenty minutes are needed to complete it. The author has provided centile norms for classes VIII to XI as well as for ages 13 to 16. The test can also be used for adults and the author has provided conversion table for determining mental ages from point scores for the adult population.

The correlation of test scores against school marks at various levels vary form .50 to .78 and the lower limit of reliability of the test is .938.

MEASURE OF ACADEMIC ACHIEVEMENT

A review of previous research has revealed that the investigator in the area have employed either objective achievement test or marks obtained by students at a public examination. Since objective achievement test for the sample, under study were not available and the construction of such measures was not possible due to the paucity of time at the disposal of the investigator, the second method i.e. the marks obtained by the students at public examination were employed for this purpose.

The examination marks have been subjected to much criticism. They are not considered sufficiently
reliable and valid. However, the examination and scoring procedure adopting by the University make them fairly reliable and valid. In addition to this a suitable composite of scores obtained by the students in three subjects which further improved its reliability and validity, was employed for the present study.

Generally the investigator in the area tend to obtain the composite score of different subjects by simply adding the raw scores. It has been clearly shown by Thorndike and Hagen (1961) by the help of an example that the students tend to obtain different position when raw scores are added than when scaled scores are so added. In the present study, therefore, the raw scores obtained by the students in three subjects were transferred into standard scores with a mean of 50 and standard deviation of 10, which were then added to obtain a composite achievement score. This composite score served as a criterion measure in the present study.

MEASURE OF PERSONALITY

12 Factor Personality Inventory by Deva

A joint factorial study of Eysenck Personality Inventory (1963), Cattell 16 P.F. Scale (1962) and Guilford Personality Inventory (1956) Scueif et al. (1969) revealed twelve independent factors. The relevant items
of these inventories with a factor loading of .5 or more on these twelve factors were translated in Hindi by the author. These items constituted the present personality inventory. A cluster analysis of these items also confirmed the 12 factors. The present inventory is a measure of the following 12 factors of personality.

1. Sociability

Likes social participation, social leadership, has social poise. It is an important trait of extraverts. Introverts do not value social participation, but do not mind if need arises.

2. Jocularity

Fond of practical jokes and telling funny stories. Likes to laugh and be merry.
3. **Liveliness**

Craves excitement, carefree, easy going, optimistic, happy go lucky. Likes to be active and doing things.

4. **Impulsiveness**

Acts on the spur of moment, does not plan a head, does not tend to look before leaping. Always has a ready answer, feelings not kept under tight control.

5. **Mood Swings**

Sometimes happy and bubbling with energy and sometimes sad and sluggish without any real reason. Moods easily go up and down.

6. **Lack of Concentration**

Not able to concentrate for long hours. Tired without good reason.

7. **Shyness**

Likes working alone because he is afraid of being snubbed, hurt or offended when working with others.
It is an important trait of neuroticism. A neurotic does not want to be with other people, but is afraid of doing this.

2. Psychosomatic

Breaks down fairly easily given some degree of stress, has dizzy turns and headaches, gets short breath without having done heavy work.

3. Worries

Suffers from sleeplessness, worries about things should not have said or done. Worries too long after an embarrassing experience.

10. Nervousness

Feels highly strung and tense, gets attacks of trembling. Gets nervous in trains, lifts etc. rather than plans than do things.

11. Sensitivity

Feelings easily hurt, touchy and easily annoyed. Thumping in heart before an important occasion.

12. Inferiority feeling

Self conscious when with superiors. Feeling
that one is not capable as others, apprehensive of not being popular, feels that others dislikes him/her.

The inventory can also be scored for extraversion and neuroticism. The combined scores of factors 1 to 4 and that of factors 5 to 12 yield measures of extraversion and neuroticism respectively.

The inventory is in a reusable form. The response to the different items are to be recorded on a separate answer-sheet. The responses may be either yes or no.

**Scoring**

The responses are to be scored by the help of scoring stencils. Only the answer in conformity with the key are to be scored. Each correct response carries a single mark.

**RELIABILITY AND VALIDITY**

The split half reliability on 100 normal subjects ranged from .55 to .75 for the different factors of the inventory. The split half reliability was .72 for the Extraversion Scale and .65 for the Neuroticism scale.
The test retest reliability ranged from .53 to .72 for the different factors of the inventory.

The items of the inventory have been selected after a factor analysis of 3 well known personality inventories, as such the item of the present inventory possess sufficient validity. As a further check on the validity of the inventory, persons considered sufficiently familiar with the personally dimensions extraversion and neuroticism were asked to nominate friends and acquaintance known to them for some while who seemed to be outstandingly extreme on either of the two dimensions. Nominated extraverts and neurotics possessed significantly different scores from nominated introverts and stable subjects respectively.

Lemon test as suggested by Corcoran (1964) was also employed to test the validity of the extraversion scale of the inventory. The lemon test is based on the fact that introverts are habitually in a state of greater cortical arousal than extraverts and consequently they show lower sensory thresholds and greater reaction to sensory stimulation (Eysenck 1967). This test measures the salivary reaction of subjects to the stimulus of
having four drops of lemon juice placed upon the tongue for twenty seconds. The score on the test is the amount of salivation produced under lemon juice stimulation conditions as compared with the amount of salivation produced under neutral conditions. Extreme extraverts show little or no increment in salivation, while extreme introverts show a substantial increment (almost 1 gm) in salivation. 10 extreme extraverts as identified by this inventory showed no increment in salivation and 10 extreme introverts similarly identified showed an average salivation increment of .75 gms.

**SAMPLE OF THE STUDY**

Sample of the study consisted of one hundred boys and one hundred girls studying in the pre university (science) class of Aligarh Muslim University, Aligarh. As clearly stated in chapter I that in the new scheme suggested by the Kothari Commission (1966), the diversification starts after ten years of schooling. The students have to select courses at the Pre University class level. Therefore, this stage was selected for the present study.

**STATISTICAL TECHNIQUE EMPLOYED**

After identification of over and under achievers
by the procedures described in the beginning of the present chapter 25 of the over achievers obtaining the highest scores and 25 of the under achievers obtaining the lowest scores were selected from the sample of the boys as well as that of the girls. The scores obtained on the twelve personality factors by these over and under achievers were compared separately for the two samples. Comparisons were also made between the over achieving boys and girls as also between under achieving boys and girls. ' t ' test was employed for making these comparisons. The following formula was employed for this purpose.

\[ t = \frac{D_m}{SE_{dm}} \]

\[ \frac{D_m}{\sqrt{(SE_{m1})^2 + (SE_{m2})^2}} \]

Where

\( D_m \) = Difference between the means of scores of two groups.

\( SE_{dm} \) = Standard error of the difference of means.

\( SE_{m1} \) = Standard error of the mean of group one.

\( SE_{m2} \) = Standard error of the mean of group two.
The standard error of the mean was calculated by the following formula.

\[ \text{SEM} = \frac{\text{SD}}{\sqrt{N-1}} \]

Where

- \( SD \) = Standard deviation of the distribution of scores of a group.
- \( N \) = Number of students in a group i.e. 25.
References


CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA
PRESENTATION AND ANALYSIS OF DATA

The present study aims at identifying the personality characteristics of over and under achieving boys and girls in scientific stream at the higher secondary level. As pointed out in the preceding chapter, Thorndike's (1963) concept has been employed for identifying over and under achievers. This is based on the relationship between intelligence and achievement. Over and under achievers identified on the basis of the relationship between intelligence and achievement were then studied for differences in their personality characteristics by the help of 't' ratio, which necessitated a measure of personality factors. The present chapter deals with the collection and analysis of the data on academic achievement, intelligence and personality.

The over and under achievers were identified on the basis of coefficient of correlation between intelligence and achievement. The legitimate use of the Pearson's Product Moment coefficient of correlation depends upon the following three important assumptions.
1. The relationship between the variables must be linear.

2. Homoscedasticity between the two variables must exist.

3. The measures must be randomly drawn.

Guilford (1950, page 151) has shown by a series of sketches that if the distributions of the two variables are symmetrical or even rectangular let alone being normal, the relationship between them can be assumed to be linear. Guilford (1956) also writes "normality or near normality of both the distributions correlated is sufficient in itself to promote linearity.

Homoscedasticity is another important assumptions for the legitimate interpretation of the coefficient of correlation. Popham (1967) is of the view that the distributions are homoscedastic if the relationship between them is linear. He writes "Ordinarily a data is considered to be distributed in a homoscedastic fashion when the relationship is linear in nature."

A perusal of the above discussion would
reveal that homoscedasticity depends upon linearity and linearity depends upon the symmetry of distribution. Thus symmetry of the distribution itself would take care of the two assumptions namely, linearity of relationships and homoscedasticity of distribution.

The differences in the personality of the over and under achievers have been studied by the help of the 't' test in the present study. The interpretation of the 't' test results required the satisfaction of two assumptions (Popham 1967).

1. The sample data must be drawn from the population.

2. The population from which the sample is drawn must be normally distributed.

In final analysis the legitimate use of the coefficient of correlation & 't' values would need the satisfaction of the following assumptions.

1. **THE POPULATION FROM WHICH THE SAMPLE IS DRAWN MUST BE NORMALLY DISTRIBUTED.**

This assumption requires that the population
from which the sample is drawn must be normally distributed. In actual practice, however, this assumption is considered to be satisfied if the sample itself does not depart very much from normality Guilford (1956) has shown that the assumption of normality for the interpretation of 't' test is sufficiently satisfied even when the distributions are fairly symmetrical.

This assumptions can be tested by employing a measure of skewness which is an index of symmetry of distribution of scores around the mean. A very simple and practicable measure of skewness would consist in computing the means and medians of distribution and seeing if the differences between them are small and negligible then the distribution of the scores can be taken to be fairly symmetrical.

2. THE SAMPLE DATA MUST BE RANDOMLY DRAWN FROM THE POPULATION.

The sample of the present study was selected in a manner that it was representative of the population of pre university class students studying in Aligarh Muslim University, Aligarh. Therefore, this assumption
is satisfied.

The distribution range and other statistics of the intelligence and achievement data have been presented in the following pages to see if they satisfied the basic assumptions essential for the legitimate use of the coefficient of correlation and \( t \) values.

**MEASURES OF ACADEMIC ACHIEVEMENT**

A composite of scores obtained in these science subjects at the public examination conducted by Aligarh Muslim University, Aligarh were employed as measures of academic achievement. As pointed out in chapter III the University examination marks can be considered fairly reliable and valid because the University issues elaborate directions for the scoring of examination script. Since the answer scripts for each of the papers in each of three science subjects were examined by the same examiner. Therefore, there was hardly any chance of errors due to subjectivity influencing the scores.

The scores obtained by the students in three subjects possessed different means and standard
deviations. Table 4.1 presents the means and standard deviations of raw scores obtained in the three science subjects by the boys and table 4.2 presents these statistics for the girls.

**TABLE 4.1**

**MEAN & S. D. FOR THE DISTRIBUTION OF RAW SCORES IN 3 SUBJECTS (BOYS).**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>MEAN</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>66.97</td>
<td>10.67</td>
</tr>
<tr>
<td>Physics</td>
<td>31.62</td>
<td>4.3</td>
</tr>
<tr>
<td>Chemistry</td>
<td>31.21</td>
<td>5.15</td>
</tr>
</tbody>
</table>

**TABLE 4.2**

**MEAN & S.D. FOR THE DISTRIBUTION OF RAW SCORES IN 3 SUBJECTS (GIRLS).**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>MEAN</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>66.34</td>
<td>16.21</td>
</tr>
<tr>
<td>Physics</td>
<td>30.53</td>
<td>5.31</td>
</tr>
<tr>
<td>Chemistry</td>
<td>32.79</td>
<td>5.54</td>
</tr>
</tbody>
</table>
It would be seen from the table 4.1 & 4.2 that the means and standard deviations for the three subjects are different. Therefore, in order to obtain a composite score these raw scores can not be simply added. The raw scores were therefore converted into standard scores by the help of the following formula.

\[
\text{Standard Score} = \frac{(X - \bar{X})}{\text{SD}} + \frac{10}{50}
\]

Where

- \(X\) = Score
- \(\bar{X}\) = Mean of the total sample
- \(\text{SD}\) = Standard deviation of the total sample

The standard scores obtained for the three subjects were then added to get the criterion score.

Table 4.3 presents the range & other statistics for the distribution of the criterion scores obtained by boys and girls.
TABLE 4.3

RANGE AND OTHER STATISTICS FOR THE DISTRIBUTION OF CRITERION SCORES OBTAINED BY BOYS AND GIRLS

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Range/ Mean or Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>3-111</td>
<td>48.33</td>
<td>49.13</td>
<td>28.04</td>
<td>3.85</td>
</tr>
<tr>
<td>Girls</td>
<td>4-110</td>
<td>49.14</td>
<td>51.08</td>
<td>24.83</td>
<td>4.26</td>
</tr>
</tbody>
</table>

It will be seen from the above table that achievement scores for boys range from 3 to 111, the ratio of range and S.D. is 3.85, which indicates that the spread of scores is sufficient. The difference between the mean and median is only 0.8 which is negligible showing thereby that the distributions of the criterion score is fairly symmetrical so as to warrant the legitimate use of coefficient of correlation.

The table also shows that the ratio between range and standard deviation of the criterion scores obtained by girls is 4.26 and the difference between mean and median is 1.94. These two values indicate that the spread of the criterion scores obtained by girls is
fairly wide and symmetrical.

Table 4.4 presents the range and other statistics for the intelligence scores obtained by boys and girls.

**TABLE 4.4**

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Range/ Mean</th>
<th>Range/ Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys</strong></td>
<td>12-90</td>
<td>56.31</td>
<td>56.95</td>
<td>17.59</td>
<td>4.43</td>
<td>.64</td>
</tr>
<tr>
<td><strong>Girls</strong></td>
<td>11-95</td>
<td>56.47</td>
<td>56.38</td>
<td>21.78</td>
<td>3.85</td>
<td>.09</td>
</tr>
</tbody>
</table>

The table 4.4 shows that the ratio between the range and standard deviation of the intelligence scored obtained by boys is 4.43, which shows that the spread of scores is fairly wide. The difference between mean and median is .64 which is also small, which shows that the distribution is fairly symmetrical.
The ratio of range and standard deviation for the distribution of intelligence scores obtained by girls is 3.85, which shows that the spread of scores is fairly wide. The difference between mean and median is .09 which is negligible, showing thereby that the distribution is symmetrical. The above statistics show that the distribution of the intelligence scores of both boys and girls are suitable for the legitimate use of the coefficient of the correlation.

**IDENTIFICATION OF OVER AND UNDER ACHIEVERS**

As mentioned in chapter III over and under achievers were identified on the basis of the techniques suggested by Thorndike. This technique consists in computing the predicted achievement on the basis of regression between intelligence and achievement. This predicted achievement is then compared with the actual achievement. An over achiever is the one whose actual achievement is more than the predicted achievement and an under achiever is one whose actual achievement is below the predicted achievement.
IDENTIFICATION OF OVER AND UNDER ACHIEVING BOYS

The following procedure was employed for calculating the coefficient of correlation between intelligence and achievement.

\[
\rho_{xy} = \frac{\text{N} \text{EXY} - \text{EX} \cdot \text{EY}}{\sqrt{\text{N} \text{EX}^2 - \text{EX}^2 \text{EY}^2 - \text{EY}^2}}
\]

The following values were obtained for the intelligence and achievement scores obtained by the boys comprising the sample of the study.

\[
\begin{align*}
\text{EX} & = 5631 \\
\text{EX}^2 & = 348027 \\
\text{EY} & = 4833 \\
\text{EY}^2 & = 312251 \\
\text{EXY} & = 310279 \\
\text{N} & = 100
\end{align*}
\]

Where
\[
\begin{align*}
X & = \text{Score on Jalota's test of General Mental Ability} \\
Y & = \text{Criterion score (Achievement)}
\end{align*}
\]
A regression equation was then set up for the relationship between intelligence and criterion scores. The regression equation for the boys was

\[ Y' = r_{xy} \frac{\sigma_Y}{\sigma_X} (X - M_X) + M_Y \]

Where

- \( Y' \) = Predicted value of achievement
- \( r_{xy} \) = Correlation of intelligence and achievement scores.
- \( X \) = Intelligence predictor
- \( M_X \) = Mean of the intelligence scores
- \( M_Y \) = Mean of the achievement scores
- \( \sigma_Y \) = Standard deviation of the achievement (criterion) scores
- \( \sigma_X \) = Standard deviation of the predictor scores.
Achievement scores predicted on the basis of the above regression equation were then calculated. Predicted achievements of two students, one securing the lowest intelligence score and other the highest intelligence score were calculated. The calculation of the predicted achievement of these two students are presented below.

**Highest Predicted Achievement Score of Boys**

\[ Y' = 0.79 \left( \frac{28.04}{17.59} \right) \left( 90 - 56.31 \right) + 48.33 \]

\[ = 91 \]

**Lowest Predicted Achievement Score of Boys**

\[ Y' = 0.79 \left( \frac{28.04}{12.59} \right) \left( 12 - 56.31 \right) + 48.33 \]

\[ = 8 \]

A linear graph was drawn between the measures of intelligence and predicted achievement. Predicted achievement of all the students comprising the study were read from this graph.
The predicted achievement scores obtained by the boys were then compared with their actual achievement scores. Over and under achievers were identified on the basis of discrepancy between the actual and the predicted achievement. 25 of the highest over achievers and 25 of the lowest under achievers were selected from the over and under achievers thus identified. Table 4.5 and 4.6 present the predicted and actual achievement scores and the discrepancies between them of the 25 over achieving and 25 under achieving boys respectively.
### Table 4.5

**Intelligence, Actual & Predicted Achievement**

Scores of Over Achieving Boys

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<th>Discrepancy</th>
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IDENTIFICATION OF OVER AND UNDER ACHIEVING GIRLS

The following procedure was employed for calculating the coefficient of correlation between intelligence and achievement of girls.

\[
ryx = \frac{\text{EXY} - (\text{EX})(\text{EY})}{\sqrt{\text{EX}^2 - (\text{EX})^2 \text{EY}^2 - (\text{EY})^2}}
\]

The following values were obtained for the intelligence and achievement scores obtained by the girls comprising the sample of the study

\[
\begin{align*}
\text{EX} &= 5547 \\
\text{EX}^2 &= 366354 \\
\text{EY} &= 4914 \\
\text{EY}^2 &= 303168 \\
\text{EXY} &= 309036 \\
N &= 100
\end{align*}
\]

Where

\[
\begin{align*}
X &= \text{Score on Jalota's General Mental Ability} \\
Y &= \text{Criterion score (Achievement)}
\end{align*}
\]
A regression equation was then set up for the relationship between intelligence and criterion scores. The regression equation for the girls was

\[ Y' = r_{xy} \frac{\sigma_y}{\sigma_x} (X - M_x) + M_y \]

Where

- \( Y' \) = Predicted value of achievement
- \( r_{xy} \) = Correlation of intelligence and achievement scores
- \( X \) = Intelligence predictor
- \( M_x \) = Mean of the intelligence scores
- \( M_y \) = Mean of achievement scores
- \( \sigma_y \) = Standard deviation of the achievement (criterion) scores
- \( \sigma_x \) = Standard deviation of the predictor scores.

Achievement scores predicted on the basis of the above regression equation were then calculated.
Predicted achievements of two students one securing the highest intelligence score and other securing the longest intelligence score were calculated. The calculation of the predicted achievement of these two students are presented below.

**HIGHEST PREDICTED ACHIEVEMENT SCORE OF GIRLS**

\[
Y' = 0.57 \left( \frac{24.63}{21.78} \right) (95-56.47) + 49.14
\]

\[
= 74
\]

**LOWEST PREDICTED ACHIEVEMENT SCORE OF GIRLS**

\[
Y' = 0.57 \left( \frac{24.63}{21.78} \right) (11-56.47) + 49.14
\]

\[
= 20
\]

A linear graph was drawn between the measures of intelligence and predicted achievement. Predicted achievement of all the students comprising the study were read from this graph.

The predicted achievement scores obtained by the girls were then compared with their actual achievement scores. Over and Under achievement were identified on the basis of discrepancy between the actual and the
predicted achievement. 25 of the highest over achievers and 25 of the lowest under achievers were selected from the over and under achievers thus identified. Table 4.7 and 4.8 present the predicted and actual achievement scores and the discrepancies between them of the 25 over achieving and 25 under achieving girls respectively.
TABLE 4.7

INTELLIGENCE, ACTUAL & PREDICTED ACHIEVEMENT SCORES
OF OVER ACHIEVING GIRLS

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PERSONALITY CHARACTERISTICS OF OVER AND UNDER ACHIEVERS

The differences in the personality of over and under achievers were studied by testing the significance of difference (t test) between the scores obtained on the different personality factors by boys & girls separately.
### Table 4.9

**t**-**values for significance of difference between mean of personality scores obtained by over and under achieving boys**

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PERSONALITY PROFILES OF OVER AND UNDER ACHIEVING BOYS

- --- Over achieving
- --- Under achieving

PERSONALITY VARIABLES

FIG. 4.1
Table 4.9 and figure 4.1 show that the over and under achieving boys differ on personality dimension, sociability, Shyness, Worries and Inferiority. They do not differ on personality dimension, Jocularity, Liveliness, Impulsiveness and Sensitiveness.

The table and figure indicate that over achieving boys are more shy ( 't' value 1.31 significant at .1 level ) They want to work alone because they are afraid of being offended when working with others. The over achieving boys have also been found to possess a feeling of inferiority. The 't' value is 2.01 is significant at .05 level which means that they become self conscious in the presence of superiors. This personality trait is perhaps linked with their trait of shyness. The over achieving boys have obtained a higher mean score on the personality dimension Worries than the under achievers. The 't' value of 1.06 is significant at .1 level. This indicates that the over achievers are more worried than the under achievers.
The over achievers have been found to be more sociable at social gatherings than the under achievers. The 't' value being 1.16 is significant at .1 level.

It would seem that the over achievers are at the same time sociable and shy but the sociability as indicated by Personality Inventory employed means the sociable nature at the social gatherings. The personality dimension shyness is indicative of the nature while doing professional work like study etc.
<table>
<thead>
<tr>
<th>Personality Factor</th>
<th>OVER ACHIEVING</th>
<th>UNDER ACHIEVING</th>
<th>Difference of Mean</th>
<th>SE of Difference of Mean</th>
<th>t Value</th>
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<td>SD</td>
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<td>4. Impulsiveness</td>
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<td>3.23</td>
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<tr>
<td>5. Mood Swing</td>
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<td>7. Shyness</td>
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<td>9. Worries</td>
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<td>11. Sensitiveness</td>
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<td>1.27</td>
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</table>
PERSONALITY PROFILES OF OVER AND UNDER ACHIEVING GIRLS

- - - - Over achieving

- - Under achieving

PERSONALITY VARIABLES

FIG. 4.2
PERSONALITY CHARACTERISTIC OF OVER AND UNDER ACHIEVING GIRLS

Table 4.10 and figure 4.2 indicates that the over achieving girls differ from the under achieving ones on personality dimensions Sociability, Jocularity, Liveliness, Impulsiveness and Nervousness. There is no difference between them on the remaining personality characteristics.

The table & figure show that the over achieving girls are more sociables, the 't' value is 1.29 which is significant at .1 level. They take part in social gatherings, like social leadership and have social poise. The over achieving girls have been found to be more Jocular than the under achieving girls. The 't' value is 1.61 (significant at .1 level) which means that over achieving girls are fond of practical Jokes and like to laugh and be merry. The over achieving girls have also been found to be more lively than their under achieving counterparts. The 't' value is 2.20 (significant at .05 level). This indicates that the over achieving girls are more optimistic, happy go lucky than under achieving girls. The over achieving girls are also more impulsive than the under achieving girls. The 't' value is 1.22 significant at .1 level which
means that over achieving girls always have a more ready answer than under achieving girls.

The over achieving girls have been found to be less nervous than underachieving girls. The 't' value is 2.23 which significant at .05 level. It shows that under achieving girls feel highly strong and tense, get easily nervous. The personality dimension Sociability, Jocularity, Liveliness and Impulsiveness are well known to be the characteristics of an extraverted person. Thus the over achieving girls can be regarded as more extravert than the under achieving girls.
<table>
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<tr>
<th>Personality Factor</th>
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<th>Over Achieving</th>
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<th>t Values</th>
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<td>tration</td>
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<td>7. Shyness</td>
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<td>2.38</td>
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PERSONALITY PROFILES OF OVER ACHIEVING BOYS AND GIRLS

MEAN SCORES

PERSONALITY VARIABLES

FIG. 4.3
After comparing the personality characteristics of over and under achieving boys and girls comparison were also made between the over achieving boys and over achieving girls as also between the under achieving boys and under achieving girls.

**PERSONALITY CHARACTERISTIC OF OVER ACHIEVING BOYS AND GIRLS**

Table 4.11 and Figure 4.3 show that over achieving boys and girls differ on the personality dimension Liveliness, Impulsiveness, Lack of Concentration, Psychosomatic, Worries, Sensitiveness and Inferiority. There was no difference between them on the remaining personality dimensions.

The over achieving boys have been found to be more sensitive than over achieving girls. The 't' value is 4.51, significant beyond .01 level which means that the over achieving boys are more touchy and easily annoyed than the girls.

The table and the figure show that the over achieving girls are found to be more Lively i.e. they are more carefree easy going and active than over achieving
boys. The 't' value is 1.98 which significant at .1 level. The over achieving girls have also been found to be more Impulsive. The 't' value is 1.85 significant at .1 level. The over achieving girls have also been found to possess a lesser concentration than over achieving boys. The 't' value is 1.22 significant at .1 level. The over achieving girls have been found to be more Psychosomatic than the over achieving boys. The 't' value is 1.28 significant at .1 level.

The over achieving boys have been found to be more Worried than over achieving girls. The over achieving boys have been found to be more Sensitive than over achieving girls. The 't' value is 4.51 significant beyond .01 level which means that the over achieving boys are more touchy and easily annoyed than the girls. The over achieving boys also seem to suffer from a higher feeling of Inferiority than the over achieving girls. The 't' value 1.64 significant at .1 level.

PERSONALITY CHARACTERISTIC OF UNDER ACHIEVING BOYS AND GIRLS

The under achieving boys and girls have been found to differ on personality dimensions, Liveliness,
**Table 4.12**

**Values for Significance of Difference Between Mean of Personality Scores Obtained by Under Achieving Boys and Girls**

<table>
<thead>
<tr>
<th>Personality Factor</th>
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<th></th>
<th></th>
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<th></th>
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<th>S.E. of Difference of Mean</th>
<th>t Values</th>
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<td>.88</td>
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<td>7. Shyness</td>
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<td>8. Psychosomatic</td>
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<td>9. Worries</td>
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<td>.42</td>
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</table>
PERSONALITY PROFILES OF UNDERACHIEVING BOYS AND GIRLS

- --- Boys
- --- Girls

MEAN SCORES

PERSONALITY VARIABLES

- Inferiority
- SENSITIVENESS
- Nervousness
- Worries
- Psychosomatic
- Shyness
- Lack of concentration
- Mood swing
- Impulsiveness
- Liveliness
- Jocularity
- Sociability

FIG. 4.4
MoodSwing, Shyness, Psychosomatic and Sensitiveness. They did not differ on the remaining personality dimensions.

Table 4.12 and figure 4.4 show that the under achieving boys are more Lively than under achieving girls. The 't' value is 1.05 significantly at .1 level. The under achieving boys have been found to be more Moody than the under achieving girls. They are sometimes happy and bubbling with energy and sometimes sad and sluggish without any real reason. The 't' value is 3.13 significant at .01 level. The under achieving girls have been found to be more Shy than the under achieving boys. The 't' value is 1.13 (significant at .1 level). The over achieving boys have been found to be more sensitive than under achieving girls. The 't' value is 4.67 which significant beyond .01 level.
REFERENCES


CHAPTER V

SUMMARY, CONCLUSION, AND SUGGESTIONS
SUMMARY CONCLUSION AND SUGGESTIONS

Summary

Diversified courses have been introduced by the different States in India, but the admission to these courses is more often than not, determined not by the talents of the child but by the glamour of the future prospects that some of the courses that seem to have in store for the students. This results in large scale wastage in the form of failure and under achievement. This wastage is not only in terms of money but also affects the personality of the child adversely and his future achievement motivation suffers a serious set back. Thus there is a need of selecting students for the different streams of courses in accordance with their talents.

Kothari Commission (1966) has recommended that diversification should start at XI class stage i.e. after ten years of class XI or Pre University class should therefore be made on the basis of the suitability of students talents for success in the different streams.
The present investigation attempts to identify the personality characteristics of over and under achieving students (boys and girls) studying in scientific stream at the pre-university level (Higher Secondary level of 10+2 scheme) such a study is likely to help in selecting students for the scientific stream because diversification of courses starts at this stage.

Thorndike's (1963) concept of over and under achievement has been employed in the present study. According to him an over achiever is the one whose actual achievement is more than the achievement predicted on the basis of relationship between intelligence and achievement and an under achiever is one whose actual achievement is below this predicted achievement.

Jalota's Test of General Mental Ability was employed as a measure of intelligence. Raw Scores obtained by the students in three science subjects, mathematics, Physics and Chemistry were converted into standard scores. A total of these standard scores served as a criterion measure. Deva's 12 Factors Personality Inventory was employed as a measure of personality characteristics.
The above measures were administered to 200 boys and girls studying in pre-university (science) class of Aligarh Muslim University, Aligarh. Over and Under achievers were identified on the basis of the regression equation between intelligence and achievement. Differences in the personality characteristics of 25 of the highest over achievers and 25 of the lowest under achievers were studies. It was found

(1) The over achieving boys are more Shy, Self conscious, Worried and Sociable than under achieving boys.

(II) The over achieving girls are more Sociable, Jocular, Lively, Impulsive and more Confident (Opp. Nervous) than under achieving girls.

(III) The over achieving girls are more Lively, Impulsive, more Psychosomatic, more Worried, Sensitive and Self Conscious than the over achieving boys. The over achieving girls possess a lesser Concentration than over achieving boys.

(IV) The under achieving boys are more Lively, Moody and Sensitive than under achieving girls. The under achieving girls more Shy than the under achieving boys.
Conclusion

(I) The over achieving boys have been found to be more sociable than the under achieving boys. The studies in the area however, found that high achievement is associated with a social nature. Dhaliwal (1971) found that over achievement goes with reserved nature, while under achievement goes with tendencies of outgoing traits, and happy go-lucky disposition. However, Lavin (1965) supports the result of present study. According to him high level of academic performance is associated with greater socialization and social presence. Sociability is as important aspect of adjustment and good adjustment has been found to be associated with high academic achievement. Saxena (1972) and Srivastava (1967) found that the over achieving students had a consistently and significantly lower number of problems of adjustment in the various areas measured than the under achievers. The under achievement was related to poor social and emotional adjustment. Therefore, the result of the present study seem to be justified.

(2) The over achieving boys have been found to be more
Shy and Self conscious than the under achieving boys. As pointed out earlier this Shyness is concerned with the individual's nature while doing professional work and studies. Sociability mentioned under para one above is the individual's personality characteristics exhibited at social gatherings. Shyness and Self Conscious nature are characteristics of Neuroticism. Researches in the area have obtained inconsistent relationship between Neuroticism and Academic Achievement while Savage (1962), Rao (1963), Savage (1965), Basu (1970) obtained negative relationship between Neuroticism and Academic Achievement. Furneaux (1956), Boradbent (1958) and Upmanyu (1974) obtained a positive relationship between these two variables. Thus the results of the present study find support from a sizable number of research workers.

(3) The over achieving girls have been found to be more sociable, Jocular, Lively and Impulsive. These four personality characteristics are well known as the dimensions of extraverts. Thus Extravert girls have been found to achieve higher as compared to the Intravert girls. This finding is rather strange in view of the results obtained by most of the researches in the area. Furneaux (1956) and Vidhu (1968) found that Intrverts achieve higher than
the Extraverts. However, Finlayson (1970) could not obtain any significant difference in the academic achievement of Intraverts and Extraverts. These studies mentioned above have employed overall achievement as their criterion and seem to have made no attempt to control the effects of intelligence on achievement while the present study has restricted itself to the achievement in scientific stream only and employed Thorndike's (1963) concept of over and under achievement which controls the effect of intelligence. Thus the results of the present study through contrary to that of the others in the area should be relied upon. It is a common dry experience that most of the high achieving girls possess a sociable and happy disposition as compared to under achievers who look brooding, glum and anxious. Thus the findings of the present investigation are also corroborated by every day experience.

(4) Over achieving girls have been found to possess a higher degree of confidence (opp. Nervousness) as compared to Under achieving girls. The study by Lavin (1965) supports their finding. He found that high achievers were more self Sufficient and Controlled as compared to low achievers. In life situations also regularly hard working students exhibit
a higher degree of confidence than the Shirkers. Thus the association of high achievement and confidence seems justified.

(5) Over achieving girls have been found to be more lively and more impulsive than the over achieving boys. This indicates that while both over achieving boys and girls are extravert in nature but the over achieving girls are more so than the over achieving boys.

(6) The over achieving girls are more psychosomatic, worried sensitive and self conscious than the over achieving boys.

Suggestions and Suggestions for further researches

1. The present research study has attempted to identify some personality characteristics of over and under achieving boys and girls in scientific stream at the pre university level (Higher Secondary level of 10 + 2 scheme). This may help in identification of students at the time of admission. They are likely to achieve high in this stream.

2. The present study has employed only 12
personality characteristics for identifying differences in the personality of over and under achievers. Other personality characteristics like anxiety, mental health, achievement motivation may play a more significant role in this regard. These variables should also be studied for differences in the personality of over and under achievers.

3. The present study has attempted to investigate the personality characteristics of over and under achievers in scientific stream only. These personality characteristics should also be studied for over and under achievement in other academic streams namely literary, commercial and constructive and different vocational streams for the purposes of differential prediction.

4. Intellectual factors are as important as the personality factors for differential prediction. Factors like convergent thinking, divergent thinking and other similar factors as hypothesised in Guilford's Structure of Intellect Model should also be studied for differential prediction.

5. The present investigation has attempted to control intelligence for the study of the relationship between personality and academic achievement. Factors like study habits, Socio-Economic Status play an important role in
determining academic achievement. Future studies should also attempt to control these variables for the study of relationship between personality and intellectual factors and academic achievement.

6. The present study has employed Thorndike’s concept of over and under achievement for controlling the effect of intelligence. Other statistical techniques like analysis of variance, analysis of co-variance and co-efficient of partial correlation are available for this purpose. These statistical techniques may also be employed in similar studies.

The present investigator is conscious of the many shortcomings of the present research, particularly those concerned with sampling and the criterion measure. But it is being submitted with the hope that it would motivate further research in the area, which would help in better educational guidance.
References


