CHAPTER - II

OVER - UNDERACHIEVEMENT : THEORY AND RESEARCH

2.1 CONCEPTS OF OVER - UNDERACHIEVEMENT:

Educators are commonly interested in knowing whether a student is working up to his ability. Here the term 'ability' refers to students performance on an IQ test or on a specific aptitude test. Suppose a student performs better relative to the average of his age or grade group, on a test of aptitude or mental ability than on an achievement test in some subject matter field. This situation is of a great concern to the teacher or an educator. Such a student is termed as an 'underachiever'. Similarly, a student is termed as an 'overachiever' if he performs better relative to the average of his age or grade group on a test of achievement, than on a test of aptitude or mental ability. Any child who falls below the average of all children is thought of as a underachiever and who falls above the average of all children is thought of as an over-achiever. This assumes that all children are of the same ability. We know that all 6 year olds or all 10 year olds are not the same - with respect to either native endowment or life experiences. The differences show up on our measures of academic aptitude as well as on any other measures that we can apply to children.

Putting aside the errors of measurement, which are very real in both aptitude and achievement appraisals, the
two involve somewhat different things. Especially as we consider marks by teachers, these reflect interest, effort, ability to understand what the teacher wants and skill of pleasing him, as well as capability in some special segment of academic content so the correlation of aptitude with achievement is positive but not perfect, and the pupils at the very top in measured aptitude will be above average, but not necessarily very top in achievement.

Kowitz & Armstrong explained the underachiever as "the pupil who is not working hard enough to achieve to the limits allowed by his abilities".

Those who consider intelligence tests direct measures of hereditary potential often characterize children whose MAs are higher than their achievement scores as "underachievers", that is, as failing to learn as much as they can. Although they receive less attention, overachievers are equally numerous, and, by the same logic, are learning more than they can.

To account for this state of affairs statisticians & testers began to plot regression equation to predict variations in achievement from intelligence scores. This approach has led to the classification of three type of achievers. Type one included achievers who achieved more than what they were expected to achieve, type two included
those who approximately achieved what they were expected to achieve and type three represented those who achieved less than what they were expected to achieve, all on the basis of their intelligence scores. Later on, research workers began to term the first category of pupils as overachievers, the second as average achievers, and underachievers. This approach is strikingly different from the traditional approach in which the teachers classified their pupils as high achievers, average achievers and low achievers on the basis of their actual academic achievement, mainly because it used the intellectual ability of pupils as a basis for predicting their academic achievement and for that reason it was considered to be better than traditional approach. The traditional approach not only ignored the fact of intelligence while classifying the pupils into high and low achievers but it also was arbitrary in that it did not conform to the usual principles of a normal probability curve. The regression based classification thus went beyond the traditional approach as it interpreted achievement in terms of intelligence and abilities and, therefore, proved to be scientifically sound than the latter which was based exclusively on achievement and that, too being arbitrary categorised.

It has always been hoped by teachers and educators that the use of appropriate measures in education would make
it possible to identify those students whose potentially good performance was being adversely affected by other factors not related to ability. In order to carry out such a diagnosis, it was thought necessary to administer two kinds of tests - a test of intelligence or innate ability and a test of achievement. The difference between an individual's scores on these two would then be taken as an indication of the extent to which his achievement in school was falling short of his ability. Very often the concepts of over- and underachievement become semantically troublesome. While it was reasonable to conceive of an individual who was working below his potential, the question was sometimes asked, how is it possible to achieve beyond one's potential. The term 'potential' seems to imply a physiological limit that by definition, cannot be exceeded.

Without making any attempts to resolve these issues, the research in this area has simply remained concentrated on the question of accounting for the discrepancy between actual and predicted achievement

2.2 METHODS OF IDENTIFYING UNDER-OVER ACHIEVERS:

Thorndike (1963) has suggested that it is necessary to define underachievement as the discrepancy of actual achievement from some predicted value based on the
regression equation between aptitude and achievement. This procedure controls for the well known regression effect that so often confounds the findings of research employing standardized tests. This is probably the most serious methodological weakness in existing studies, and, according to Thorndike the "failure to recognise this regression effect has rendered questionable, if not meaningless much of the research on achievement (p. 5)".

Tiegland, Winkler, Munger and Kranzler (1966) identified fourth grade underachievers by predicting grade-point average from the verbal scale of the Wechsler Intelligence Scale for children. If the grade point average predicted by a regression equation was 0.8 standard error of estimate above the obtained grade point average, the student was identified as an underachiever. This technique was also used by Perkins (1965) using 1.00 standard error of estimate. Hummel and Sprinthall (1965) modified this procedure somewhat and employed a grade point discrepancy score derived as the difference between the actual grade point average and the predicted average. Underachievers were defined as those pupils with grade point discrepancy scores that fell one or more standard deviations in the negative direction from the average discrepancy score of the population. Superior achievers were selected by the same
procedure but in the opposite direction; thus, the two groups were separated by at least two standard deviations. A different procedure used by Curry (1961) identified underachievers as those whose T-scores on the California Achievement test were ten or more points below their T-scores on the California Test of Mental Maturity. Overachievers were identified as those pupils whose California Achievement Test scores were correspondingly above their T-scores on the California Test of Mental Maturity.

A somewhat definitive evaluation of various techniques used to identify over and underachievers was undertaken by Farquhar & Payne (1964). The importance of their study and its immediate relevance to the present review merit its report in some detail. The authors pointed out the contradictory conclusions often resulting from inconsistency in operational definitions of over and underachievement. Techniques of selection were then grouped into four distinct categories as follows:

1. Central tendency splits: under and over achievement are determined by dichotomizing a distribution of combined aptitude and achievement measures.

2. Arbitrary partitions – middle group eliminated: Discrepancies are determined by contrasting extreme
groups in achievement aptitude distributions and by eliminating a middle group.

3. Relative discrepancy splits: Grade point average and aptitude predictors are ranked independently. Under and overachievement are determined by the discrepancy between the sets of ranks.

4. Regression model selection: A regression equation is used to predict achievement from aptitude measures. Under and over achievement are then determined on the basis of the discrepancy between actual and predicted achievement.

There could be an extreme range in the absolute number of individuals identified as under and overachievers, depending on the particular technique used.

The concept of over-underachievement is based on the assumption that assessment of academic achievement of an individual is inextricably bound up with his abilities and as such should not be governed by arbitrary standards of academic success and failure. Stated in different terms the assumption implies that the extent to which one achieves more or less than what a majority students of his ability level are achieving would indicate the level of his over and underachievement. The phenomenon of over-underachievement
is basically dependent upon the determination of an individual's actual academic achievement and the achievement that can be expected of him on the basis of his abilities.

Of all the factors employed for determining the expected level of academic achievement, intelligence is probably the only one which has invariably been used by all the investigators. There are, however, sharp differences among the investigators regarding the techniques and procedures through which intelligence has been used for determining the expected level of achievement and, thus, identifying over-underachievement.

Broadly speaking, these techniques and procedures can be classified into three categories. These categories are described in the sections to follow.

2.2.1 (A) **Variability in achievement at constant level of intelligence:**

According to some investigators over and underachievement is a variability in achievement at a constant level of intelligence. At a given intelligence level, James and Elmore (1962) considered those pupils who have the same level of intelligence but fell within the upper and lower 27% groups of the cumulative frequency distribution for achievement as overachievers and underachievers...
respectively. Similarly Parsley (1967) divided their sample into five intelligence groups determined the mean achievement for each group and added and subtracted 0.6 grade placement to and from each of the means to locate the upper & lower limits. Pupils who fell below the lower limit were designated as underachievers and those who fell above the upper limit were considered as overachievers and those falling between these two limits were treated as Average achievers. Eugence (1964) found out percentile norms of achievement for each IQ point from the lowest to the highest rather than determining the upper and lower limits for an intelligence group. The norms indicated the degree of over and underachievement.

Shaw (1957), Frankel (1960), Morrow & Wilson (1961) and Violet (1967) in separate studies selected groups of children with high intelligence and referred to the high achieving subjects as overachievers and the low achieving subjects as underachievers. Forehlick and Hoyt (1959) and later on Diener, Srivastava (1966) and Bhatnagar (1966) designated as overachievers those students with below average intelligence but above average academic achievement. Underachievers as those with above average intelligence but below average academic achievement.

The investigators seem to believe that all differences in academic achievement are due to variations in
intelligence only. This cannot be true, because the coefficient of correlation between them is not perfect. This means that in addition to intelligence there are some other variables which determine academic achievement. These variables are also important and should be taken into account while defining overachievers and underachievers. These studies have followed a wrong assumption that all the individuals within a certain range of intelligence may be treated as similar in ability and hence would have the same level of academic achievement. There are two weaknesses in this approach: (i) The students with different levels of I.Q. are considered as equal in ability; (ii) they are also considered to achieve at the same level. This approach was, therefore, not considered appropriate for the identification of over - underachievers in the present study.

2.2.2 (B) Discrepancy between achievement and intelligence:

Duff & Lawrence (1960) considered over - underachievement as a discrepancy between comparable scores on achievement and intelligence. Likewise, Franzen (1920) & Monroe and Buckingham (1920) divided the Educational age by Mental Age. This ratio was multiplied by 100 and was named as Achievement Quotient (A.Q.). Pupils scoring within a range of 86-115 A.Q. were considered Average achievers; those whose A.Q. scores were 116 or more were regarded as overachievers and those whose A.Q. scores were 85 or less were regarded as underachievers.
The above approach used the factor of Mental Age for determining the Educational Age, which was considered to be a more valid index of learning capacity. Achievement Quotient indicated whether the individual was achieving up to his mental capacity or not. This technique also suffers from mentally superior individuals would have achievement equal to their Mental Age, second defect in using the A.Q. is that frequently the population samples upon which the educational achievement tests have been standardized are not comparable with those upon which the norms of intelligence tests have been based. Generally, the former are less representative of population and are dependent, of course, upon the quality of the schools in which the standardisation process was carried out. Third defect is the fact that school marks and many achievement tests also do not differentiate as well among pupils as does a sound test of general intelligence. This fact tends to reduce the variability of the former and its correlation with the latter. A fourth defect of the Quotient or the ratio approach and of the discrepancy approach as well is that they are not free from regression effect as a result of which pupils of high Mental Age become underachiever and those with low Mental Age turn out to be overachievers. This is an artifact and is not indicative of actual truth. It was
because of this defect that Pinter (1921), Mc Phail (1922), Peters (1926) and Marshall (1967) did not adopt this technique for the identification of over-underachievement in their respective studies. Freeman (1950) and Ross (1954) also did not favour the use of A.Q for this purpose. Hence the measures of over-underachievement based on direct discrepancy or ratio between intelligence and achievement owing to these glaringly inherent defects were not adopted for differentiating the over & underachievers in the present study.

2.2.3 (C) **Discrepancy between observed and predicted achievement:**

To overcome the limitations inherent in the approaches referred to earlier, Nygaard (1936), Cureton (1937) and Tsao (1943) in separate studies suggested the use of regression of Educational Age (E.A.) on Mental Age to find out the expected or estimated Educational Age (E.A. est). The Educational Age (E.A.) was then divided by the estimated Educational Age (E.A. est.) and the ratio was multiplied by 100. Nygaard (1936) and Cureton (1937) referred to this modified quotient as regression Achievement Quotient (R.A.Q.) but Tsao (1943) termed it as Effort Quotient (E.Q.) and Fleming as Success Quotient (S.Q.). According to this formula pupils whose quotient was 100 were
Average achievers and those who obtained above and below the 100 Quotient were respectively termed as over and under-achivers.

The formula, however is not free from defects even in this revised form. Achievement is a normally distributed ability. In a normal distribution, the number of average achievers is considerably larger than that of over & under-achievers. In actual application of this formula, the number of average achievers is found to be far less than that of over & underachievers. This is because there are very few pupils whose quotient is found to be exactly 100. To overcome this defect Goodenough (1949) has suggested the following procedure: (1) find out the deviation (d) of the obtained Educational Age (E.A.) from the estimated Educational Age (E.A. est) by subtracting the latter from the former (E.A. - E.A. est); (2) find out standard Error of the estimated Educational age; (3) divide the deviation score (d) by standard Error of Estimated Educational Age (E.A. est) to get the standard score; (4) treat the standard score as an index of the magnitude of over underachievement & then (5) finally, consult the normal curve table to determine the probability of a chance deviation of such magnitude.

The discrepancy or deviation approach suggested by Goodenough (1949) was later on adopted by several investiga-
tors (Odell, 1932; Phillips, 1943; George & George, 1959; William & Lionel, 1959; Mabel, 1960; Carter, 1961; Lois & Bernard, 1962; Pierce, 1962; Smith, 1963; Thorndike, 1963; Norman, 1964; Holland & Robert, 1964; Warren, W. Willingham, 1964; Marshall, 1967 and Violet Quimboy, 1967) with the modification that instead of using Educational Age they used achievement tests scores. Discrepancies thus found out between actual & predicted achievement were of two types: positive & negative. The positive discrepancy indicated a higher actual academic achievement than the predicted academic achievement and the negative discrepancy showed a lower actual academic achievement than the predicted academic achievement. The former was regarded as an index of what was designated as overachievement and the latter as underachievement.

It will be realised from these studies that the above approach is essentially based on the discrepancy between the actual academic achievement & the predicted academic achievement, the latter being predicted on the basis of a regression equation between intelligence and achievement. As a matter of fact, the genuineness of over-underachievement is largely a matter of accurate prediction of achievement. In other words, the more comprehensive, precise & reliable the predictor, the greater will be the genuineness of over-underachievement.
Investigators differ on the use of predictors which can make the most accurate prediction of achievement. As pointed out earlier, all investigators agree on the use of intelligence as a predictor of academic achievement. However, they do not show the same degree of agreement whether intelligence alone or in combination with certain other predictors can make the most accurate prediction of academic achievement. Some of them (Goodenough, 1949; John, 1954; Carter, 1959; Mabel, 1960 and Norman, 1964) are of the view that intelligence alone is sufficient to make the most satisfactory prediction of academic achievement, but there are many investigators (Phillips, 1943; Odell, 1952; George & George, 1959; William & Lionel, 1959; Lois and Bernard, 1962; Rao, 1963; Smith, 1963; Thorndike, 1963; Holland & Robert, 1964; Willingham, 1964 and Marshall, 1967) who do not subscribe to this view. They contend that besides intelligence other factors influencing academic achievement should also be included in the regression equation for making the most accurate prediction of achievement.

This is because, they assert, the correlation between intelligence & achievement in the majority of studies ranges from 0.35 to 0.55. A correlation of 0.55 just gives an estimate of 16% better than chance. This is not a very high figure to be used as a basis of prediction. Hence,
they advise to combine intelligence with other predictor variables in order to increase the accuracy of prediction.

The net result of this trend of thinking is the preference for a team of predictors to one predictor alone and to use multiple regression equation for the purpose. The main assumption behind this preference was that the present achievement of an individual is a product of factors operating within the individual (e.g. special & general intellectual abilities, motivation etc.) and outside the individual (e.g. home & school conditions etc.). Given a knowledge of all the possible influencing factors, a few enthusiasts, however, went so far as to claim that they could make a perfect prediction of the academic achievement. That this is an overambitious claim is evident from the fact that, in the first place, it is not possible to know all the influencing factors, secondly, even if these be known, it is difficult to ascertain the degree of their influence for linear relationship may not exist between academic achievement and many of these factors (e.g. non intellectual), and thirdly, predictor tests are not absolutely free from errors of measurement. There is, of course, no denying the fact that employment of a large number of factors can improve the accuracy of prediction.

George & George (1959) from their review of the
achievement predicting factors have concluded that "To date, aptitude score combined with an index of high school performance in a multiple regression equation have yielded the best estimate of the grade point average (G.P.A.)", (p. 68). In this statement, aptitude refers to scholastic aptitude or intelligence, high school performance to past achievement and grade point average (G.P.A.) implies present achievement.

Holland (1960) after subjecting 130 predictors to Whorry Doolittle technique & F-test has arrived at the same conclusion. William and Olson (1959), Rao (1963) and Thorndike(1963) have also suggested the combination of these two factors. The latter in addition, recommends to include such other stable factors as socioeconomic status, sex & age, but barring socioeconomic status, findings with regard to the predictive effectiveness of the other two factors are conflicting.

From the above, it may be inferred that in any scheme for accurate prediction of academic achievement, intelligence, past achievement & socioeconomic status should find a place. Over underachievement then world be a discrepancy between the actual academic achievement and the predicted academic achievement, prediction being made on the basis of these three predictors. Identification of over
underachievement made through this procedure seems to be free from all those defects and deficiencies from which the contrasting achievement approach & discrepancy and ratio approach suffered and contain all the good points of the prediction based discrepancy approach.

For reasons already explained in the earlier chapter, the procedure that has been recommended by Thorndike for the identification of over-underachievement seemed to be most appropriate and was therefore, adopted in this study. Thorndike defines over and underachievement in terms of discrepancies between actual academic achievement and predicted academic achievement. Identification of over-underachievement, therefore, depends upon the determination of actual or criterion academic achievement and the predicted academic achievement. For predicting academic achievements, Thorndike has suggested the use of a group of factors which includes intelligence, past achievement socioeconomic status, sex and age. But for the last two factors, that is, sex and age both of which have been controlled by confining the study to only male eighth grade early adolescents, the other three factors constitute the predictor variables.
2.3 RESEARCH ON OVER-UNDERACHIEVEMENT:

Researchers have made a lot of contribution to find out the various factors which affect and are associated with underachievement of school students. The factors which influence the over-underachievement may be intellectual as well as non-intellectual.

2.3.1 Over-underachievement in general:

Some of the researchers did a lot of effort to find out the cause of under and overachievement. Here we have to discuss both intellectual & non intellectual variables which makes the student under or over achievers.

Srivastava (1967) did an investigation into the factors related to educational underachievement. Findings indicated that (i) Underachievement was related to (a) poor study habits (b) poor reading ability which included poor reading speed, Vocabulary and spelling (c) low academic motivation (d) poor health (e) poor social and emotional adjustment and (f) problems concerning family and school (ii) Underachievement was related to various background and personal factors like age, S.E.S., father's profession, size of family, number of siblings, birth order, reading interests, failures in school exam. & participation in games and sports & (iii) no significant relationship was found to exist between underachievement and instances of parental
structure, hobbies, interest in games, sports & music and attitude towards school.

Dhaliwal (1971) did a study of some factors contributing to academic success and failure among high school students—Personality correlates of academic over-underachievement. The purpose of the present investigation was primarily to study personality correlates of academic success, failure or to be more precise of academic over and underachievement. The results arrived at in the two phases of the investigation revealed that

1. superior study habits, reservedness, high verbal ability, home, emotional & school adjustment, poor social adjustment and security feelings corresponded with overachievement i.e. academic success, whereas inferior study habits, outgoing tendencies, low verbal ability, emotional instability, assertiveness, happy go like temperament, poor adjustment in home, emotional & school areas, good social adjustment and insecurity feelings were associated with academic underachievement, i.e. academic failure; &

2. anxiety & need for achievement bore a curvilinear relationship with over and underachievement, implying thereby that both overachievement and underachievement go with higher need for achievement and greater anxiety in comparison to normal achievement.
Menon (1972) did a comparative study of personality characteristics of overachievers and underachievers of High Ability. The main findings of the study were (i) demographic factors & socioeconomic status markedly influenced over and underachievement, (ii) higher occupational and educational level of father, educational level of mother, (iii) family income and parental attention were related to high achievement but the extent of relationship was not similar for boys and girls, (iv) Job aspiration, educational aspiration and general ambition were strongly associated with high achievement, particularly for girls, (v) Urban residence was related to high achievement.

Menon (1973) also did a comparative study of the personality characteristics of overachievers and underachievers of High Ability. The results revealed that (i) overachieving groups of boys and girls of superior ability as well as the general group were found to be less extrovert and maladjusted while overachieving boys of general group were found to be less socially active and masculine, (ii) over achieving groups of boys of girls of superior ability as well as the general group were found to show greater academic interest and endurance; over achieving girls from general group and overachieving boys of both groups were also found to have greater general ambition; overachieving boys and girls from higher ability as well as general groups
showed that their persistence was greater, (iii) overachieving girls of the general group showed greater interest than underachievers in aesthetic, social & mechanical activities and less interest in outdoor, persuasive & clerical activities; overachieving boys of the general groups had more interest in aesthetic activity & less interest in outdoor work, while high ability overachievers among boys had an interest in mechanical activities and (iv) overachievement and underachievement were found to be influenced by socioeconomic and demographic characteristics.

Abraham (1974) studied some factors relating to underachievement in English of secondary school pupils. The study revealed that (i) the achievement level was associated with attitude towards English personal adjustment & S.E.S. (ii) there was greater proportion of normal achievers among girls as against boys, (iii) Underachievement was more frequent in rural schools and overachievement in urban schools (iv) Overachievers were proportionately more in private schools than in government schools, (v) Underachievement was more in higher age group & overachievement was more in lower age group, (vi) the factor pattern of the total sample was significantly different from the factor pattern obtained for the underachievers and overachievers where as it was highly comparable with the pattern obtained for the normal achievers. (vii) the three factors obtained
were Scholastic Disposition, General adjustment & social stimulation which accounted for variance of both general group and the normal achieving group. (viii) For the overachievers only Linguistic Disposition and General adjustment were needed to account for total variance. (ix) For urban achievers group adjustment, social personal adjustment & scholastic Disposition were found to be the factors responsible for explaining total variance.

Chaudhari, Jain (1975) studied factors contributing to academic underachievement. The major findings of the study were (i) The factors contributing to academic underachievement varied significantly with sex. (ii) Bright children normally come from families where parents had higher level education, were mostly engaged in professions requiring general knowledge and knowledge of mathematics, and had more income than the parents of dull students. (iii) The mothers of bright achievers had higher level of education than the mothers of underachievers. (iv) Bright achieving female candidates had better general adjustment. (v) Product movement coefficient of correlation between n-achievement and home adjustment was 0.34 & 0.17 respectively for girls and boys. (vi) Product moment coefficient of correlation between n-achievement and mother's education was 0.34 and 0.15 in the case of girls and boys respectively.
Agarwal (1975) did a psychosocial study of academic underachievement at secondary school level in the state of Rajasthan.

The major findings of the investigation were (i) The overachievers had stronger educational, social and humanistic values than the underachievers, but on the remaining three values - materialistic, religious & personal the two groups were alike, (ii) The urban overachievers had stronger educational, social and humanistic values than the urban underachievers. The rural underachievers and overachievers did not differ significantly on any of the six values, (iii) Parent's values were related to student's academic achievement. The parents of the overachievers gave more importance to education of their wards than the parents of the underachievers, (iv) S.E.S. of the parents of the underachievers and overachievers was related to their achievement. Sharma (1981) investigated the factors related to academic underachievement of girls of secondary schools located in rural areas of Haryana. It was found: 1. Poor academic motivation, linguistic ability, planning of study work, adjustment and emotional insecurity contributed to underachievement. 2. The underachievers were significantly
poor in their performance on all these variables. 3. All
the variables included in this study were inter related.
Hence remedial programmes for underachievers had to be
necessarily global in approach.

Beedawat (1976) did a study of academic
underachievement among students. The major findings of the
study were (i) intensity of incidence of underachievement
was more or less uniform in the urban and rural areas. (ii)
incidence of underachievement was higher in science groups.
(iii) the proportion of underachievers among girls was
larger than that among boys. (iv) very few of the
underachievers were found to be outgoing, warm hearted and
easy going. (v) 75% of the students among underachievers
possessed average emotional stability and (vi) about 40% of
students were found to be possessing qualities like
impulsively lively and gay enthusiastic.

Singh (1983) studied under and over academic
achievement and its motivational correlates (A Factor
Analytic Study). The findings of the study were: 1. Two
factors were derived from correlation matrix of UAs at 'I'
level. One factor was named the 'Motivation Factor'. The
second factor operative in this group was labelled as the
'Self Debasing Factor'. 2. Only one factor was extracted for OAs at 'I' level. This was called the 'Self Promoting Motivation Factor'. 3. One factor was obtained for UAs at U+I level. This factor was recognised as the 'Aggressive Assertion Factor'. 4. Two factors were found for OAs at 'U+I' level. One factor was called the 'Value Aspiration Factor'. The second factor was named the 'Benevolent Assertion Factor'. 5. The motivational organizations of the two contrasting groups were found to be opposite in nature. 6. The motivational organization of UAs was found to be significantly less harmonious than that of OAs.

Gupta (1983) studied personality characteristics of Ninth grade over & underachieving boys and girls at different levels of achievement motivation.

The findings of the study were: 1. The group of low motivated overachieving boys was found to be more vigorous and Zestful than the group of low motivated underachieving boys. Among the underachieving boys, the low motivated group was found to be least vigorous and zestful. 2. The high motivated underachieving girls were more submissive and less
tense than high motivated overachieving girls. But low motivated underachieving girls were less submissive and more tense than the low motivated overachieving girls. 3. Overachieving boys were less expedient and less shy and had less undisciplined self conflict than the underachieving boys. 4. Overachieving girls were less affected by feelings and more emotionally stable, less shy and more vigorous and zestful and had less undisciplined self conflict than the underachieving girls. 5. Among boys, the high motivated group and average motivated group were found to be more sober, less happy-go lucky, and had less undisciplined self conflict than the low motivated group. 6. Among girls, the high motivated group was more intelligent and less expedient than the low motivated and average motivated groups, and was less shy and had less undisciplined self conflict than the low motivated group. The high motivated group did not differ significantly from the average motivated group in shyness and undisciplined self conflict. 7. The average motivated boys did not differ from low motivated boys in scholastic ability, expediency, shyness and undisciplined self conflict. 8. Neither the two levels of achievement nor the three levels of achievement motivation differed significant by on personality factors - A, B, C, E, O & Q₃ for boys, and A, D, F, I, O and Q₂ for girls. Interactional effect was also not found in these personality factors. 9. Over
achieving boys differed from underachieving girls in G, H and Q₃ and overachieving girls differed from underachieving girls in C, H, J and Q₃ personality traits. 10. There was significant interaction in academic achievement and achievement motivation both in the case of boys as well as girls in the case of J personality factor.

Haq (1987) did a study of certain personality correlates of over-underachievement in different school subjects.

The findings may be summarised as the male over achievers in Hindi were found to be more prone to be enthusiastic (F) but less excitable (D) and less tough minded than the male under achievers in Hindi.

The male over achievers in English were more prone to obedience, submissiveness, and accommodating temperament, while the underachievers in the same subject were more inclined to be assertive, competitive and aggressive (E).

The male overachievers in Mathematics differed from the underachievers only one one personality measure. The over achievers were found to be relaxed (Q₄) and the underachievers tense. On the other 13 factors of HSPQ the differences were insignificant.

In Science, the male overachievers exhibited no
significant difference from the underachievers on any of the 14 personality factors.

The difference between the female over and underachievers in Hindi was found to be insignificant on each of the 14 dimensions of personality. In English the over and underachieving girls differed significantly on several personality factors. The over achieving girls were found to be more assertive (E), more enthusiastic (F), more inclined to tough mindedness (I), and more prone to be self sufficient ($Q_2$), but less intelligent (B), and less prone to circumspect individualism (J). The underachieving girls in English, on the other hand, were comparatively less assertive, less enthusiastic and less tough minded, but more intelligent, more prone to circumspect individualism and more sociably group dependent.

The female overachievers in Mathematics exhibited significant differences on two out of 14 personality factors. The over achieving girls were found to be more enthusiastic (F) and more self sufficient ($Q_2$) than the underachieving girls.

Among the girls, overachievers in science were more inclined to be reserved (A) and more self sufficient ($Q_2$) than the under achievers.
As regards sex differences, the over achieving boys in Hindi exhibited higher scores than the overachieving girls on intelligence (B), emotional stability (C), adventurousness (H) and circumspect individualism (J). The overachieving girls, on the other hand, were more excitable (D), more apprehensive (O) and far more tense ($Q_4$) than the male overachievers. In English the overachieving boys were found to be more intelligent (B) and emotionally more stable (C) and prone to be obedient (E) than the overachieving girls, while the female overachievers in English, on the other hand, were more assertive (E), more self sufficient ($Q_2$) and more tense ($Q_4$) than the male overachievers in English.

In Mathematics the overachieving boys were found to be higher than the over achieving girls on intelligence (B), emotional stability (C), surgency or enthusiasm (F) and adventurousness (H), while the female overachievers were more apprehensive (O) & more self sufficient ($Q_2$). On Factor E, the boys were prone to be obedient and the girls assertive. Results on $Q_4$ showed that the male overachievers in Maths were relaxed and the female subjects tense.

The overachieving boys in science also showed higher intelligence (B), greater emotional stability (C), more of adventuresomeness (H), and greater circumspect individualism (J) than the overachieving girls. The female subjects, on
the other hand, were more assertive (E), more apprehensive (O), more self sufficient (Q₂) and far more tense (Q₄) than the male overachievers in Science.

The underachieving boys in Hindi were found to be more reserved (A), more intelligent (B), emotionally more stable (C), more adventurous (H) and more prone to toughmindedness (I), circumspect individualism (J) and self assured temperament (O) than the underachieving girls. The male subjects were also more inclined to be obedient (E) and relaxed temperament (Q₄) while the female subjects were assertive (E) and tense (Q₄).

In English the underachieving boys were emotionally more stable (C), more excitable (D), more assertive (E) more sober (F), more toughminded (I), more prone to circumspect individualism (J), more apprehensive (O) and sociably more dependent (Q₂) but less tense (Q₄) than the underachieving girls.

In Maths, the male underachievers were higher than the female underachievers on reservedness (A), intelligence (B), emotional stability (C), adventurousness (H), toughmindedness (I), security (O), and self control (Q₃). The male underachievers were also prone to be obedient (E) and relaxed (Q₄), while the female subjects were prone to be assertive (E) and tense (Q₄).
In Science the male underachievers were more reserved (A), emotionally more stable (C), more tough minded (I), and more prone to circumspect individualism (J), and more self assured (O). On factor $Q_4$, the male subjects were found to be relaxed and female subjects tense.

The results of the sixteen analysis by means of 't' test reveal that (1) overachievers in different school subjects differ from the underachievers in their personality characteristics or combination of differential characteristics with only two exceptions - the over and underachieving boys in Hindi, and girls in Science do not show any significant differences. (2) The male over and underachievers differ from the female over and underachievers in each of the four knowledge areas. Besides, every individual group is marked for its own personality pattern, quite different from others. The results on sex differences also reveal some personality characteristics as male characteristics and some other as female characteristics.

Puri (1987) studied personality traits & self concept of 16-18 years old underachievers. The main findings of the study were: 1. About 19.8 percent of the intellectually gifted students did not come upto the expected level of academic performance. 2. The majority of
the underachievers belonged to lower socioeconomic groups and had proper self concept. 3. The underachievers generally tended to be warm-hearted and easy going, had comparatively lower scholastic capacity, and were inactive. They tended to be assertive, aggressive, stubborn and dominant, were impulsive, lively, happy-go lucky and gay persons, and tended to be socially bold. They were generally over protected, sensitive, individualistic and reflective, and were found to be apprehensive, worrying and troubled. 4. The underachiever girls tended to be more group dependent, and were generally tense, over wrought and frustrated.

2.3.2 Over-underachievement in science:

Many researches were done on under-overachievement but very few researchers made studies on over-under-achievement in science.

Mathew (1976) studied some personality factors related to under-achievement in science.

The major objectives of the study were (i) to identify a group of personality variables that could act as causal factors of underachievement in science at the secondary level and (ii) to empirically verify which of the identified variables actually discriminate between the
different levels - over, normal and underachievers in science.

The study revealed that (i) the mean scores of normal achievers exceeded significantly the mean scores of underachievers for variables like sense of personal worth, sense of personal freedom, withdrawing tendencies, social standards etc. and the mean scores of normal achievers were significantly less than the mean scores of underachievers in test anxiety & maladjustment; (ii) the mean scores of overachievers were significantly greater than those of the normal achievers in cases of sense of personal freedom, social standards and family relations, (iii) the mean scores of overachievers significantly exceeded the mean scores of underachievers in cases of self reliance, sense of personal freedom, freedom from withdrawing tendencies, freedom from nervous symptoms, social standards, social skills, freedom from antisocial tendencies, family relations and community relations, (iv) a higher number of overachievers were the high intelligence, low age group amongst boys and among the parents with higher education than their respective counterpart, (v) greater number of overachievers were found amongst high income urban subjects & (vi) four factors - total adjustment, anxiety orientation, group adjustment and self esteem - accounted for total variance of the
overachieving group and five factors - personal adjustment, social adjustment, social facilitation, leadership and self acceptance - accounted for the total variance of the normal achieving group.


The main purpose of the study was to find out (1) relationship between socioeconomic and educational factors and achievement in General Science, (2) to study the impact of ineffective teaching on underachievers in science. On the basis of data consolidated, it was concluded that home and school environment play a significant role in poor achievement. The overall findings of the present study supports the hypothesis that low achievers in science come from home having low income, low social status and low educational attainment of parents. It further supports the second hypothesis as well as that ineffective teaching in science results into underachievement in pupils.

2.4 ISSUES AND CONTROVERSIES:

This chapter has been mainly concerned with definition and identification of over-underachievers. Once these students have been identified, it would be a logical next step to determine the nature of factors associated with
the phenomenon of underachievement and to take steps to correct them. R.L. Thorndike (1963) observed that the whole phenomenon of over-underachievement may be thought of as the problem of errors of prediction and offer the following reasons for these errors:

(i) Errors of measurement or unreliability both in the predictor and the criterion.

(ii) Heterogeneity in the criterion variable resulting from the intermingling of two or more subgroups, each evaluated on a continuum which is actually different for each subgroup.

(iii) Limited scope in the predictors, i.e. not all of the relevant determiners of the criterion have been studied.

(iv) Unpredictability of events that intervene between the prediction and outcome such as variations in the quality of instruction, remedial teaching, guidance etc.

(v) Unmodifiable characteristics in the individual's nature or background such as sex, race, socioeconomic status, parents education, customs, attitudes and opportunities of intellectual stimulation both at home and in the community.
(vi) Personal and educational factors that are modifiable and manipulable.

The focus of the present study is on the unmodifiable characteristics of the individual. Although a large number of studies are available which suggested that these variables are associated with over-underachievement. But, nobody has meaningfully quantified their impact on the problem. The present investigator has attempted to find out the proportion of variance in the unpredicted (residual) part of achievement scores that is due to each of these unmodifiable personal characteristics. In fact there is a need for such a study.