CHAPTER II

VARIABLES

Many investigations conducted in the past have revealed a host of variables that are related to academic achievement. As indicated in these studies a number of psychological as well as environmental factors are claimed to have a fairly strong bearing on scholastic attainment. In a study by Lafferty (1962) low mental ability, lack of interest, poor health and physical defects, poor and morbid home conditions, outside work and interests, irregular attendance and laziness have been reported as variables most frequently associated with failure in schools. Dave (1968) observes that the factors affecting achievement run all the way from intelligence to physical health, through the socio-economic status of the family, caste, distance from school, leisure-time activities and others.
Intelligence has been recognised as a determining factor in academic performance by various investigators. Several other factors, pertaining to the personal, social, psychological and emotional make up of the individual, have also been found to affect the nature and extent of scholastic attainment. (Bishton, 1957). Factors influencing academic performance have been classified into three main categories by Bhatnagar (1968).

1. Intellectual factors
2. Personality factors.
3. Non-intellectual non-personality factors.

For the purpose of the present study, only those variables, which have direct impact on the achievement of pupils in schools and can be measured with verbal group tests are selected.

They are:

A. PSYCHOLOGICAL VARIABLES

I. INTELLIGENCE
II. NON-INTELLECTUAL PERSONALITY FACTORS
1. Social activity
2. Extraversion
3. Tolerance
4. Neuroticism
5. Masculinity
III. MOTIVATIONAL FACTORS

1. Academic interest
2. General ambition
3. Persistence
4. Endurance

IV. ADJUSTMENT

1. Home adjustment
2. Health adjustment
3. Emotional adjustment
4. Social adjustment
5. School adjustment

V. ANXIETY

B. ENVIRONMENTAL VARIABLES

1. Caste
2. Educational status of parents
3. Occupational status of parents
4. Monthly income of the family
5. Number of siblings
6. Order of birth
7. Distance from the school
8. Number of days of absence in school
9. Attention paid by parents in the child's studies
10. Living with or away from parents
11. Number of hours of study
12. Tuition if any
13. Attitude towards different academic subjects
14. Reading habit
15. Co-curricular activities
Eysenck (1957) regards intelligence as an important dimension of personality. Guilford (1959) recognises the importance of the general dimension of aptitude in his personality theory. It is perfectly clear that students cannot achieve at any level without the necessary ability. A large number of studies have been reported on the relationship between intelligence and achievement. Jordan (1923), Thurstone (1925), Toops (1926), McPhail (1927), Edds and McCall (1933), Martson and Sprow (1941) and Durflinger (1943) have pointed out low but significant correlation between general mental ability and academic attainment. The coefficients reported are in the range of 0.315 to 0.60. Ross and Hooks (1930) present a group of correlations between intelligence and achievement in high school subjects and argue that they are positively and significantly related. The coefficients range from 0.18 to 0.72. The median coefficients calculated for different subjects are:

<table>
<thead>
<tr>
<th>Subject</th>
<th>School marks</th>
<th>Achievement tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>0.44</td>
<td>0.45</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.37</td>
<td>0.41</td>
</tr>
<tr>
<td>Language</td>
<td>0.33</td>
<td>0.46</td>
</tr>
<tr>
<td>History and English</td>
<td>0.45</td>
<td>0.37</td>
</tr>
</tbody>
</table>
Reviewing a number of studies about general mental ability and academic achievement Kinney (1932), Segal (1934) and Garret (1949) conclude that intelligence is positively and significantly related to scholastic attainment. Clell (1942) and Schwilck (1959) hold academic achievement to be directly and significantly related to intelligence. Gough (1953) obtains correlations ranging from 0.62 to 0.80 with three samples of high school seniors between intelligence and grades and Carter (1959) reports a correlation of 0.60 for his samples. Jacob (1959) observes significant correlation between Terman I.Q. scores as well as several other aptitude measures (e.g. verbal learning, numerical ability, mechanical reasoning, spelling, sentence usage, English proficiency and arithmetic proficiency) and achievement scores in English, Social Studies, Mathematics and Foreign language. Edminster and Reades (1959) obtain a correlation as high as 0.82 between language intelligence scores of California Test of Mental Maturity and general achievement scores from California Achievement Test. Welins, Mackinney and Stephens (1961) in a factorial study claim that general intelligence is a significant factor in high school science achievement. According to Dugan (1962), I.Q is positively correlated to achievement. Kamii and Weikart (1963) state that the intelligent quotients of those who were retained once in Elementary Schools are significantly lower than those of the regularly promoted students. Hayes (1963) maintains that
scholastic aptitude tests are good predictors of academic success. Butcher and others (1963) report that intelligence as measured by M.S.P.G. correlated 0.45 with English, 0.34 with Mathematics, 0.33 with Science, 0.23 with History and 0.26 with Geography. Keller and Rowley (1964) obtain high and significant correlation between intelligence and scholastic attainment. Sorenson (1964) stresses that in general, correlations between intelligence test scores and achievement in academic subjects are the highest and range from 0.4 to 0.5. Frost (1965), Vane (1966), Ainsworth (1967) and Brenner and Gillman (1968) observe fairly high positive correlation between intelligence and achievement.

Studies conducted by Indian authors — Chotia (1954), Dosajh (1958), Rath (1959), Chatterji and Gupta (1960) and Ramnath (1962) indicate that general intelligence is positively related to scholastic performance. Shukla (1958) observes the following correlations between intelligence and scholastic achievement in seven subjects.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gujarathi (mother tongue)</td>
<td>0.71</td>
</tr>
<tr>
<td>English</td>
<td>0.52</td>
</tr>
<tr>
<td>Second Language</td>
<td>0.55</td>
</tr>
<tr>
<td>History</td>
<td>0.46</td>
</tr>
<tr>
<td>Geography</td>
<td>0.45</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.62</td>
</tr>
<tr>
<td>Science</td>
<td>0.46</td>
</tr>
</tbody>
</table>
Sinha (1966) after studying 185 high achievers and 190 poor achievers brings our attention to the fact that high achievers are found to be ten points higher in I.Q. George (1968) reports the following correlations between verbal intelligence and achievement scores of different subjects obtained by pupils in Standard X.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malayalam (mother tongue)</td>
<td>0.52</td>
</tr>
<tr>
<td>English</td>
<td>0.60</td>
</tr>
<tr>
<td>Hindi</td>
<td>0.47</td>
</tr>
<tr>
<td>Social Studies</td>
<td>0.45</td>
</tr>
<tr>
<td>General Science</td>
<td>0.47</td>
</tr>
<tr>
<td>General Mathematics</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Many investigators on the other hand have reported results that are somewhat at variance with the above. Young (1927), Cocking and Holy (1927), O'Brien (1928) find that intelligence is not a significant factor in producing academic successes and that there is little difference between the mental ability of successful and unsuccessful students. Oates (1929) concludes that the discrepancy that prevents complete agreement between measures of scholastic achievement and intelligence does not arise entirely through errors in our measurement of them but is probably due to the presence of factors other than intelligence in the situation.
Harris (1931), Engle (1934), Thompson (1934), Spinelle and Nemzek (1944) have stated low correlations between intelligence and scholastic achievement. Rupp and Kirk Patrick (1940) hold that it would be hazardous to predict college success on the basis of intelligence test scores alone. Cohler (1941) investigating the scholastic status of achievers and non-achievers comes to the conclusion that from elementary school through university, significant discrepancies have been noted between intelligence and scholarship among individuals. Carroll (1943) maintains that the bond between mental ability and academic achievement appears to be smaller than is usually assumed. Olson (1945) claims that academic failures occur at all levels of intelligence. Reviewing 600 titles mostly of American origin, Eysenck (1947) selecting 34 well designed studies in this area out of several hundreds, comes to the conclusion that under optimum conditions the average correlation of intelligence test scores with college marks is 0.58. McKeachie et al. (1966) referring to this order of correlation between ability measures and grades, though it is fairly high, explain that even the best measures of ability leave over half the variance in grades unaccounted for. In the studies reviewed by Eysenck the average correlation of 0.58 would account for barely 35 per cent, leaving 65 per cent to be accounted for by other variables.
The inability to predict achievement at the upper part of the distribution has led Hadley and Kennedy (1949) to state that intelligence tests alone are inadequate guides in prediction, as there are other important factors which influence academic performance and which may prevent students from achieving the grades within the range of their ability. Humphreys and Boynton (1952) report from a review of a number of investigations that, while high intelligence is of significance in scholastic attainment, it is not the only factor in academic success. Jastak (1952) argues that success and failure and functions of the whole organism of which intelligence is only a part function, therefore it does not by itself guarantee success. Wedemeyer (1953) stages that, of the college students above the 90th percentile in intelligence 29 per cent fail to attain any significant achievement in scholarship.

Comparisons made by Schwartzman (1961) between a group of failing medical students and a successful group show that the two groups are approximately equal in intellectual ability, suggesting that other factors are contributing to the students' academic performance. Schonell (1962) has found that students of low measured ability sometimes complete their university studies without failure, while some of the most promising fall by the wayside.
Vernon (1963) has put the correlation between measured intelligence and university attainment as low as 0.20. This is statistically significant correlation for a sample of 250 subjects, but it accounts for only four per cent of the variance in attainment. Factors other than intelligence thus assume importance far beyond what is customarily thought. A report recently published by the Transval Education Bureau (1967) affirms that high I.Q. does not guarantee success. One fifth of all failures in South African Universities are students who are normally classed as very gifted having an I.Q. of 130 plus. Venables (1967) in her study of engineering apprentices in England also finds little evidence that lack of ability is responsible for high failure rates.

In the light of the studies discussed above, it can be safely assumed that for scholastic success, mental ability or intelligence is an important factor, though it is not the only factor. Non-intellectual factors also seem to play a significant role in academic achievement.

NON-INTELLECTUAL PERSONALITY FACTORS

The recognition of the importance of personality factors of non-intellectual nature in scholastic performance
has stimulated a wide variety of investigations. Some early writers have lent countenance to the popular conception that emotionality and erratic emotional factors tend to go with superior intellectual endowment (Burrow, 1916). It was even suggested that emotional stability may act as a positive deterrent to achievement in scholastic pursuits. But the precise relationship between general emotionality and nervous instability on the one hand and intellectual and scholastic achievement on the other, is a subject on which researchers obtained controversial results.

Educational psychologists like Thorndike (1913), Burt (1917), Gates (1923), Hollingworth (1923) and Terman (1925) are of the point of view that psychoneurotic traits are a handicap in academic performance.

Rosen (1925) after carrying out a careful investigation with children diagnosed as neurotics and comparing them with children considered to be normal, observes no significant differences between the two groups with regard to their achievement. The amount of scatter in achievement in the two groups is about the same. Administering the Colgate Mental Hygiene Test to students in two successive classes, Young (1927) finds students prone to psychoneuroticism to be adversely affected with regard to their achievement. Crow and Crow (1942) emphasise the far reaching nature of
the influence of emotional factors in college success. Owens and Johnson (1949) hold that non-achievers exhibit symptoms of neurotic nature. Berger and Sutker (1956) report that students with high intellectual ability and adequate personality adjustment achieve better in academic situations. But Stagner (1933), after reviewing a number of previous studies observes only very negligible relationship between measures of personality and grade averages. Schneider (1957) maintains emotional maturity to be the most important non-intellectual factor, prognostic of college success. Administering the Maudsley Personality Inventory, Bendig (1960) obtains no association between neuroticism and attainment in American university students. A positive correlation between neuroticism and attainment in university students is recorded by Furneaux (1957). According to Farnsworth (1957) ten to fifteen per cent of college students have emotional problems.

Draug (1958) putting together all previous findings comes to the conclusion that the neurotic group is in general the most outstanding, if not the most successful one. He poses two questions: (1) Are superior students psychologically disturbed and (2) Do psychologically disturbed students achieve more than non-disturbed normal students? — and concludes that while most neurotics are successful, only some of the most successful students are neurotics. He observes that mildly disturbed students, achieve more than normal
students, but when the degree of disturbance is more than mild, achievement tends to suffer.

Lynn (1959) and Lynn and Gordon (1961) consider neuroticism to be positively associated with academic success. Broadbent (1958) at Cambridge, Bendig (1960) in the United States and Devadasan (1966) in Kerala point out that neuroticism has a positive influence on achievement. Savage (1962) holds that though successful students may have high neurotic scores compared with the general population, excessively high neurotic scores would be detrimental to academic success. According to him an optimum level of neuroticism exists for successful academic achievement and there is a U-shaped relationship between the two variables. The results viz. low academic status being associated with high neurotic scores obtained by Callard and Goodfellow (1962) tend to support the above finding. On the other hand Child (1964), after his investigation in this field strongly disagrees and argues that high or even moderate neuroticism is not favourably related to attainment. Findings of Kline (1966) also support the above statement since he also considers neuroticism to be negatively related to academic success. There are many other studies too that indicate positive relationship between stability (as against neuroticism) and scholastic success. (Lunzer, 1960; Hallworth, 1961; Butcher, Ainsworth and Nesbitt, 1963 and Rushton, 1966).
Young (1927) reports that in his study, intelligent introverts have fewer than one half of their expected failures. Stagner (1933) finds that students with higher scores on the introversion section of the Bernreuter Personality Inventory obtain higher grade average than those with lower scores. Eckert (1935) observes that the superior students tend to rate themselves more introverted. Neel and Mathews (1935) and Super (1942) using the Bernreuter Personality Inventory, record achievers to be more inclined to introversion. Evans and Wrenn (1942) maintain thinking introversion to be related to academic attainment. Himmelweit (1945), Lynn (1960), Lynn and Gordon (1961) hold that among other things, introversion is found to be related to scholastic success.

On the other hand Steen and Estabrooks (1928) observe no relation between introversion and scholastic performance. Wrenn, Ferguson and Kennedy (1936) using Bernreuter Personality Inventory come to the conclusion that neuroticism and introversion scores fail to discriminate the superior from the inferior students. Harris (1931) after obtaining extensive data with Marston Extraversion-Introversion Test holds that low achievers score high on extraversion. Neel and Mathews (1935) also find non-achievers to be more extraverted. Young (1936) reports that extraverted students fail more often than expected. Furnmeaux (1957), Broadbent (1958), Lynn (1959), Lynn and Gordon (1961), Savage (1962), Child (1964)
Devadasan (1966) emphasise that the extravert is handicapped in academic work. According to Callard and Goodfellow (1962) and Kline (1966) general low achievement tends to be associated with extraversion. In all these investigations except in one (Kline, 1966) extraversion scores of Maudsley Personality Inventory are used. Kline has used scores of Eysenck's Personality Inventory.

Based on extraversion-introversion scores from other tests and ratings, similar findings have been reported. Owens and Johnson (1949) observe social extraversion of MMPI to be significantly related to under-achievement of students. But Gough (1949) reports that the high achieving and under-achieving students do not differ on introversion scores of MMPI. Beach (1960) points out that the less sociable, on the basis of social introversion scores of STSDR, achieves more than the sociable student. Cattel (1960) and Holmes (1960) obtain positive relationship between introversion and achievement. Rushton (1966) has pointed out, in his review of literature on the relationship between scholastic performance and extraversion-introversion, that seventeen out of nineteen studies show significant positive relationship between introversion and scholastic success.

Other indirect evidences for the positive influence of introversion on achievement have also been reported.
Himmelweit (1945) and Lynn and Gordon (1961) observe that introverts have good vocabularies. Since vocabulary is an important aspect of achievement, these findings indicate the advantage of introversion in achievement. Delinquents display extraverted behaviour patterns, (Eysenck, 1964) and they tend to be educationally retarded, (McCarthy, 1954). This may indicate the handicap of extraverts in achievement. Introverts tend to have leptomorphic body build (Eysenck 1959 a) and leptomorphic children tend to be good readers. Good readers in general are expected to be good achievers and this may be due to the introverted nature of good readers.

From the findings of research studies mentioned above, it is apparent that the academically superior student tends to be somewhat introverted. While some of the reported studies indicate that extraversion and poor achievement tend to go together, it may be pointed out that the relationship may be one of concomitance and not causal. An extraverted student may be devoting more of his attention and time to aspects of environment around him to the detriment of his studies. This disproportionate expenditure of time may have led to lower achievement rather than the personality disposition of extraversion itself.

Most of these investigations reported above are with older children or adults. The researches with junior high
school children show a different trend. Based on ratings of faculty advisers Roach and Wall (1955) observe over-achievers to be more extraverted than under-achievers. Butcher (1953) Banks (1964) also observe extraversion to have significant positive influence on scholastic success. Savage (1966) obtains results indicating high extraversion to be related to brighter intellectual level and higher academic attainment in children. But Warburton (1962) have results not exactly identical with the above. He points out, that introversion is positively related to achievement in scientific and technological subjects and extraversion is sometimes linked with art subjects.

Using the MMPI, Altus (1947) finds trends of immaturity, femininity and a tendency towards social extraversion among academic failures. Holland (1959) using the California Psychological Inventory with a sample of students of high ability considers that the best predictions of academic success are, for males sociability and masculinity and for females responsibility and femininity. Morgan (1952) after a psychometric comparison of achieving and non-achieving college students of high ability observes maturity and seriousness of interest to be positively related to attainment. Roach and Wall (1955) arrive at the conclusion that certain favourable personality characteristics are exhibited to a greater degree by achievers than by non-achievers. Since
in their study the two groups compared are equated in intellectual capacities and background, the differences should have been caused by personality factors. Burgess (1956) reports personality measures to be useful in prediction of achievement. Shaw and Brown (1957) are of the opinion that under and non-achievement on the part of bright students are not surface phenomena and that they are related to the personality matrix of the individual. Barret (1957) holds that only by a careful and thorough study of each individual's personality, can we find the reasons for under-achievement. If the individual is under-achieving it is because he cannot adequately utilise his inner resources or because he chooses not to. Neugeboren (1958) is of the view that patterns of academic performance are related to aspects of personality structure. He concludes that these patterns of performance may sometimes be modified by new experiences and that final achievement depends on growth of the personality. Froehlich and Hoyt (1959) observe that "under-achievement is most often a sign that something is out of gear in the adolescents". According to Horral (1957) Hoyt and Gebhart (1958) Middleton and Guthrie (1959); Krug (1959); Holland (1960) and Carter (1961) there are significant personality differences between achievers and non-achievers. Paul (1962) points out that academic under-achievement can be considered as a function of one's personality.
Eysenck (1947) on the other hand finds questionnaire measures of personality traits to have little prognostic value in respect of college success. Ellis (1947) records that personality inventories have consistently shown a positive but discouragingly small relationship with scholastic attainment. Dowd (1952) studying the best and poorest achievers among students in the highest decile in scholastic aptitude as measured by ACE, reports that personality questionnaires reveal no difference between the two groups. Demors and Spoylar (1961) also observe no difference between achievers and non-achievers on any sub-tests of E.P.F.S.

**MOTIVATIONAL FACTORS**

Motivation as a construct has often been employed in studies which isolate non-cognitive correlates of academic achievement. In contemporary psychological researches, motivation occupies a key position. Motivational variables are regarded as important determiners of individual performance in different spheres. The drive and urge which the individual brings to bear on his work are vital to his success in educational field. For purposes of the present study all measures which purport to index academic interest, general ambition, persistence and endurance are considered as measures of motivation.
Eriksen (1940) stresses the importance of motivation in scholastic achievement. Tiebout (1943) concludes that his study to find differentiating factors of high and low scholarship students points to the existence of a behaviour syndrome which might be characterised as a need to rely upon strong and immediate motivation to study, a tendency to possess interests of a non-transitory and permanent nature. Ellis (1947) reports that attitude, interest and motivation have consistently shown a positive but discouragingly small relationship with academic achievement. But Gough (1949) holds, good motivation to be significantly related to academic attainment. Morgan (1952) after a psychometric comparison of achieving and non-achieving college students of high ability records that motivation to achieve is positively and significantly related to scholastic success. McClelland et al. (1953) have reported a moderate correlation of 0.51 between achievement motivation and GPAs of subjects, using college students as subjects.

Brown, Abeles and Inscoe (1954) observe motivational differences between high and low achievers. French (1955) maintains that highly motivated subjects work more efficiently than low motivated subjects. Burgess (1956) states that achievers show greater need for achievement and that they are more motivated to study than under-achievers. Strang (1949
and 1957) holds that scholastic success requires motivation as well as capacity and opportunities to learn. The poor achievers seem to have no desire to succeed in school. But Lowell (1952) on the other hand fails to obtain any significant relationship between grades and achievement motivation. The findings of Parrish and Rethlingshafer (1954) also agree with that of Lowell. They observe no significant relationship between grades and achievement motivation. But Weiss, Wertheimer and Groesbeck (1960) report positive relationship between need for achievement and grades obtained by students. Lum (1960) also finds that over-achievers tend to have stronger motivation for studying as against under-achievers who show a marked tendency to procrastinate and to rely upon external pressures to work.

Mitchell (1961) using 131 female college students, performed a factor analysis of the intercorrelation of several measures of achievement motivation and residual grade point average. The first factor loading is 0.74 on this residual measure and is interpreted by him to be the factor most closely related to academic achievement motivation. Pointing out the importance of motivation in achievement, McClelland and others (1962) suggest that pupils with high 'n' achievement score show evidence of better learning and performance. There is definite and statistically significant evidence
for superior learning in high as compared with low 'n'
achievement group. As reported by these authors the students
with high achievement need tend to regard their scholastic
achievement as a challenge and thus become more ego-oriented,
attaining a maximum level of aspiration; while those with
moderate or low level of achievement need, are chiefly con-
cerned with avoidance of failures and attain a minimal level
of aspiration. Direction and intensity of motivation are,
hence, vital for any kind of analysis of factors associated
with success and failure in school. But other investigators
have pointed out certain limitations regarding this. Accord-
ing to them achievement motivation may be directly related
to performance for some individuals, inversely related for
others and unrelated for still others. These variations,
according to French (1955); Atkinson and Reitman (1956);
Clark et al. (1956); Mitchell (1959) and Reitman (1960)
depend upon the differential operation of additional factors.
For example, some persons who are high on achievement moti-
vation may also be high on fear of failure. That is, while
they aspire to a high level of performance, they may be
afraid that they will be unable to reach this level. This
feeling may interfere with actual performance. Under these
circumstances, it is only natural that a measure of achieve-
ment motivation probably will not correlate very highly with
performance.
Myers (1964) using an objective test of achievement motivation records the correlation with grade point average of high school students to be 0.50 and 0.48 for males and females respectively. Muthayya (1964) using McClelland's technique observes the high achievers and non-achievers to differ significantly in their need achievement scores. The high achievers have significantly higher achievement scores.

Many investigations have shown positive relationship between interest and achievement. Shuttleworth (1927) reports that the successful students are found to be better interested in their school work. Alderman (1927) stresses the importance of interest in achievement. Langlie (1930) holds that students tend to obtain better grades in those subjects which they like in school. Beardie (1945) and Gowan (1957) report small but significant correlations between interest and achievement. Among college students Kerns (1957) finds that under-achievers possess less interest in academic and intellectual activities. Hopkins et al. (1958) observe that over-achievers' choice of subjects for study is in line with their interest. Chapman (1959) after comparing 112 under-achievers with 112 over-achievers concludes that the former differ significantly from the latter with regard to academic interest. Herman and Zeigler (1960) consider interest to be highly related to degree of scholastic success of students.
Weitz, Clarke and Jones (1955) maintain that students with educational goals appear to do better in college than those who have no such goals.

Persistence implies a strong drive and high level of motivation. It is a condition reflected in continuance of an activity inspite of failures. Fernald (1912) is of the opinion that success or failure of individuals depends largely on the ability to endure and continue to strive for the sake of achievement, inspite of fatigue or discouragement. Schonell (1959) observes that persistence in the school setting is indicated by the way in which a pupil keeps at a task, and by the desire to master new material and surmount difficulties. It is shown by pertinacity in carrying on, even under unfavourable conditions. Normally it is associated with strength of purpose and will power. Those who lack persistence easily give up; they are quickly discouraged and are unduly swayed by the opinion of others. They procrastinate and offer excuses for not completing the tasks; they are always eager to try something new, but not to persevere with it.

McDougall (1908) in his discussion of instinct, points out persistence as one of the objective features of purposive behaviour. Tolman (1932) though rejects McDougall's theory considers persistence as a basic criterion of molar purposive behaviour. Hull (1943) and Dollard and Miller (1950) within the context of the drive theory are concerned with the problem
of continuing action, in other words with persistence. Peak (1955) and Atkinson (1966) in their theory of motivation have emphasised persistence as an important aspect. Arguing with in the general frame work of Hebb's (1949) concepts, Bindra (1959) considers persistence as one of the defining characteristics of goal directed activity. Guilford (1959) maintains persistence as one of the achievement need factors in his theory of personality structure.

The general trend of thinking is that those with high achievement motive will demonstrate greater persistence in behaviour. Winterbottom (1968) obtains evidence for greater persistence in the groups of boys having higher 'n' achievement in comparison with the group having lower 'n' achievement. French and Thomas (1958) in their comparison of high and low 'n' achievement groups, find a positive relationship between time spent on complicated mechanical problems and 'n' achievement assessed.

The theory of achievement motivation presented by McClelland, Atkinson, Clark and Lowell (1953) relates 'n' achievement, persistence and anxiety. When task is held constant, stronger 'n' achievement is associated with greater persistence and stronger test anxiety is associated with lesser tendency to persist. (Atkinson and Litwin, 1960).
Persistence is considered by parents, teachers and educationists as a quality of the pupil that helps him to achieve better. Woodworth (1940) suggests that persistence score shows almost zero correlation with intelligence, but an appreciable positive correlation with academic success. Thornton (1941) maintains that persistence has long been assumed as one of the factors determining achievement in school. Eysenck (1947) states that persistence is an important factor which makes for the efficient use of a person's ability.

Several studies have been reported relating persistence with academic achievement. Oates (1929) and Merriott (1929) report that persistence is related to academic success. Russell (1933) holds persistence to be an important determinant for success in school. Nowells (1933) points out that the scores of a battery of persistence tests yield a correlation of 0.44 with the average academic grades for the preceding year. The observed correlation between intelligence and college grades is 0.51 and the multiple correlation of a combination of intelligence and persistence scores with college grades is 0.64. Rayans (1939) observes significant correlation (0.48) between scores on a group test of persistence and achievement expressed as honour point ratios. Holland (1960) finds significant correlations between college grades and persistence.
McAurther (1955) taking persistence score, based on a combination of eight tests with the highest communalities observes that it is correlated to the extent of 0.30 with school marks. Griffith's (1959) comparison of deteriorators and improvers in schools demonstrates that while deteriorators are below average in persistence for school work as estimated by their teachers, improvers are above average. But contrary to the common belief and observations made by several investigators, the results of some studies indicate that persistence is not so potent a factor in academic performance.

Edminster and Jackson (1949) taking nine measures of persistence of college students emphasise the fact that correlations between persistence and achievement in general are very low. Partial correlations after eliminating the influence of capacity are found to be low and not in the expected direction. From this they conclude that either there is very little relationship between persistence and achievement or methods used to measure persistence and achievement are defective. Roach and Wall (1955) in their study of over and under-achievers also stress that persistence is not a significant factor in achievement. Crane (1958) in a study observes that persistence ratings appear to predict success in the grammar school as much as the Arithmetic test. But persistence tests are not found to improve upon the predictions made with the existing battery of selection tests.
Rethlingshafer's (1942) factor analytic study of tests designed to measure persistence shows that measures of persistence are not free from the influence of intelligence. McAurthur (1955) also finds some significant correlations between measures of persistence and intelligence. Feather (1962) reviewing the study of Crutchler (1934), concludes that persistence and intelligence are correlated to the extent of 0.30.

ADJUSTMENT

The term adjustment became popular with psychologists ever since Herbert Spencer introduced it in his 'Principles of Biology' in 1864. Here he defines life as "the continuous adjustment of the internal to external relations". This connotes a mechanical relationship for adjustment, where as it is a well known fact that in modern culture, a successful person does not merely adjust himself to the environment, but also adjusts the environment to suit his purposes. This adjustment process is continuous throughout life. Generally speaking, by adjustment we mean, effective adaptation to environment, both internal and external including conformity to group norms, mores, ideals, values and so on. (Abraham, 1963). The well adjusted person has a sense of security and feeling of adequacy which grow out of his feelings of belonging, being desired and appreciated. He has trained his
aspirations to reality, i.e. what he can expect of himself in the light of his talents, social position and opportunities. He is free from excessive anxiety, depression, worry and disturbing fears. He has his emotions under control and does not permit their exaggerated expression. He has learned to direct his energies to constructive and socially desirable ends. He does not magnify his success and at the same time is not unduly put off by difficulties in his way. He is not averse to recognize or admit his shortcomings, to lower his super-ego tendencies, to find socially acceptable outlets for his impulses and thereby eliminating the necessity for self-injury or self-depreciation. (S.N. Rao, 1963).

Several investigators hold the area of adjustment to be important in academic achievement. Problems in the field of Personality adjustment are frequently reported by parents and teachers about almost all pupils and about non-achievers in particular.

Various studies have been reported relating adjustment to scholastic achievement.

Drought (1938) from an analysis of eight measures of personality adjustment in relation to scholastic attainment finds only very little relationship between personality traits of adjustment and scholastic success. Hoyt and Norman (1954)
have failed to show any significant difference in the overall adjustment of achievers and non-achievers. Uhlinger and Stephens (1960) consider that the long held hypothesis that school failure is a manifestation of maladjustment is not supported by several studies. Goldstein, Crites and Heilburn (1962) employing the MMPI with college students find no identifiable measures of personality adjustment related to college success. According to Anderson and Spencer (1963) academic achievement is not influenced by personal adjustment.

Evans (1930) observes no correlation between success and emotional stability. Keys and Whiteside (1930) employing Woodworth - Cady questionnaire and ratings of teachers hold that there is no tendency for emotional adjustment to go with good scholarship. Sutton (1961) is also of the opinion that brilliant scholastic success does not guarantee high level of emotional adjustment.

Richmond (1929) considers emotional maladjustment to be more often associated with poor performance. Stagner (1933) observes that high emotionality tends to lower achievement. Assum and Levy (1947) find personal adjustment to be positively related to academic achievement. Even when the typically maladjusted student is intellectually superior to others, he often comes below the normal achievement level. Martin (1952) holds personal maladjustment characteristic of failing students.
Berger and Sutker (1956) maintain that students with adequate personality adjustment achieve better in academic situations. Jensen (1958) states that there is a general tendency for non-achievers to encounter more adjustmental problems. According to Neilburn (1960) students with severe emotional difficulties will be less likely to succeed than those without such maladjustments.

Gates (1936) obtains significant relationship between scholastic attainment and social adjustment. Young (1936) concludes scholarship and social adjustment to be significantly correlated. Miller (1937) after studying 83 exceptionally bright students reports them to be better adjusted socially than the poor and average students. Steinzor (1944) and Kuntz and Swenson (1951) state that over-achievers are better than others in their social adjustment. On the other hand Eckert (1935), Neel and Mathews (1935) and Gough (1949) observe over-achievers to be rather withdrawn in social relations or socially not well adjusted. But in Terman's (1947) study of the genius, he finds that the emotional and social adjustment of the gifted are better than that of the general population. Owens and Johnson (1949) point out that social adjustment is positively related to academic achievement.
Horrall (1957) maintains that academic non-achievement for brilliant students is a symptom of deeprooted personality problem. Holland (1959) considers social and emotional adjustment to be significantly correlated with academic achievement. Norman and Daley (1959) and Selmer (1960) observe that there exists a significant difference in the degree of academic achievement between groups of well adjusted and poorly adjusted children, adjustment always being positively correlated with achievement. Pierce and Bowman (1960) and Taylor (1964) conclude from their investigations that high achieving students are better adjusted than low achievers. Dehan and Havighurst (1961) after comparing achievers with under-achievers point out that under-achievement is a symptom of maladjustment. Helden (1962) finds that in high school, the adjustment of high-achievers and low-achievers differ significantly and that poor adjustment of low-achievers seems to be a further manifestation of their inability to adjust to their environment. Paul (1962) reports that highest ranking students tend to be better adjusted than lowest ranking students. He suggests that personality adjustment factors are related to the level of achievement in college students. Unstable and maladjusted students are found to do less well in their studies in proportion to their intelligence than are students who are well balanced. Rao (1963) observes that under-achieving students report more adjustmental problems than achievers.
Smith (1965) finds in his study that non-achievers feel that their parents press them for grades, while achievers feel that they have applied their own pressure. Non-achievers are more negative and hostile in their attitude towards authority than are achievers. Maltin and Mendelsohn (1965) emphasise the importance of personality adjustment in academic success. According to Rushton (1966) well adjusted children tend to have higher academic attainment. Desena (1966) using Mooney problem checklist, reveals that under-achievers' chief problems are:

1. Adjustment to college work
2. Social and recreational activities
3. Social and psychological relations
4. The future vocational and educational relations
5. Personal-psychological relations

Watson (1967) is also of the opinion that good adjustment facilitates scholastic performance. These studies however are not conclusive and as Leuttit (1957) points out there is need for further research on the relationship between achievement and personality adjustment.

When the field of academic adjustment is discussed the view expressed by Stromswold and Wrenn (1948) cannot be ignored. They define school adjustment in terms of the characteristics exhibited by a well adjusted student rather than in terms of
the grades obtained. According to these authors a well adjusted student exhibits high intrinsic interest in the subject matter of his study, positive attitudes towards the requirement of his curriculum, stability of goals, balanced emotional life, ability to concentrate for a reasonable length of time on his tasks and ability to enjoy life in many aspects.

Brown, Abeles and Inscoe (1954) observe that non-achievers are characterised by 'activity delay' i.e. lack of decisiveness of action, a tendency to procrastinate and perhaps unwillingness to conform to academic requirements, routine and regulations. Cattel (1945) and Thompson (1948) point out that achievers are characterised by good adjustment to school as well as greater awareness and responsiveness to environment. Burgess (1956), Christensen (1956), Popham and Moore (1960) state that achievers and non-achievers differ with regard to their adjustment to college as assessed by Borow's Inventory of Academic Adjustment. French (1958) considers that lack of adjustment to college life, introduces extraneous influences on scholastic success. Edminster and Roades (1959) report that the school adjustment scores of California Test of Personality correlated to the extent of 0.25 with average marks. Frankel (1960) maintains over-
achievers to be more conforming to school regulations and
to be more adequately adjusted to academic situations. Lum
(1960) holds that under-achievers' adjustment to academic
life is inadequate. Roberts (1962) observes that achievers
and non-achievers differ significantly with regard to their
school adjustment. Sandefur and Bigge (1966) using Mooney
Problem Checklist and S.R.A. achievement series with ninth
grade pupils have on correlational analysis seen that

(1) the number of school related problems sensed by
the student relates inversely to school attain-
ment.

(2) the number of home and family problems sensed by
the student relates inversely to his school
achievement.

(3) the number of social and personal problems sensed
by the student relates inversely to his academic
attainment.

According to Abraham (1968) pupils for whom educational insti-
tutions appear to be wholesome and satisfying are the well
adjusted and they are free to use their potentialities to get
good grades.

ANXIETY

Anxiety is an important concept in both psychoanalytic
and learning theories of personality. It is used frequently
and sometimes loosely as a motivational concept. Hall (1964)
defines anxiety as a painful experience which is produced by excitation in the internal organs of the body. This results from internal or external stimulation and is governed by the autonomic nervous system.

The literature on anxiety is in some disarray. Though the findings are often significant there are many inconsistencies. Reed (1960) has called anxiety "the ambivalent variable". It is a highly complex variable as, a perusal of May's book (1950) demonstrates. Freud (1935) has described it "a nodal point linking up all kinds of most important questions: a riddle, of which the solution must cast a flood of light upon our mental life". It is no wonder that the literature on anxiety and academic performance is practically chaotic. Apart from the recognition that anxiety is one of the most complex variables, confusion has occurred also because of the variety of learning tasks that have been studied inside and outside the laboratory.

Warburton (1962) and Rushton (1966) identify anxiety with neuroticism though Eysenck (1963) regards anxiety as a conditioned fear reaction which is particularly characteristic of dysthemic neurotics i.e. persons who are high on the factors of neuroticism as well as introversion. Manifest anxiety, suggested by Taylor (1956) cannot be identified with neuroticism.
Lynn (1957) finds some evidence that anxious children tend to be good readers but Saramoff et al. (1959) report no such association between anxiety and achievement. Grooms and Endler (1960) point out that there is no direct and significant relationship between anxiety and school attainment. Frost (1968) also fails to observe any significant relationship between anxiety and academic achievement. Hallworth (1961) and Child (1964) find negative correlation between anxiety and achievement in secondary school pupils. Reese (1961) observes an inverse relationship between manifest anxiety and scholastic achievement. Sinha (1972) also maintains that manifest anxiety is negatively and significantly related to academic attainment. Rushton (1960) after reviewing twenty-seven researches reported on the relationship between anxiety and academic achievement, states that eleven favour the hypothesis that anxiety is positively correlated with academic success and sixteen suggest contrary results. Smith (1964) and Singh (1966) have found it as a factor interfering with the performance of students.

A number of studies reported, relate anxiety with complex learning experiments and academic performance. One theoretical expectation here is that if the learning situation is a simple or dominant response, anxious subjects will show superior performance because of their higher drive level, but
if the learning situation is complex, a number of response
tendencies will be aroused and if the dominant response is
not correct, high drive level will impede performance.
(McCandless and Castenda, 1956; Feldhusen and Klausmeir, 1962;

Mandler and Sarason (1952) hold that low anxious
subjects perform better than high anxious subjects in complex
tasks or stress motivating tasks. Waite, Sarason, Lighthall
and Davidson (1957) also observe that in experimentally
created learning situations the performance of the high
anxiety subjects is significantly inferior to that of low
anxiety groups. Saranoff, Sarason, Lighthall and Davidson
(1959) reviewing a number of studies in this area point out
that the results in those investigations do not support the
hypothesis. Sinha and Misra (1961a, 1961b and 1963) maintain
that anxiety score discriminates the high and low achievers
in engineering. Spielberger's work (1962) suggests that
ability is an intervening variable between anxiety and per-
formance. In a study of 248 students at Duke University he
records that students with high anxiety of low and middle
ability failed more frequently in their studies than students
of the same ability with low anxiety. By contrast anxiety
appears to enhance the performance of students of very high
ability having A.C.E. scores above 150.
Taylor (1956) suggests the use of Manifest Anxiety scale (MAS) for testing predictions of Hullian drive theory. But Jessor and Hammond (1957) question the theoretical basis for assuming MAS as a measure of drive strength. From a review of several studies on the topic Hill (1957) concludes that the theoretical implication of Taylor's paper will not yield predictions which have been made from it. He even points out that empirical evidence of the association between high anxiety and poor performance in complex situations may be regarded not as an evidence in support of the relationship between MAS and drive but as a refutation of the theory.

McCandies and Castenda (1956) report the relationship between manifest anxiety and achievement to be non-significant. The findings of Bendig (1957) agree with the above views. He holds that manifest anxiety and academic achievement are not related. The general pattern of relationship observed by Keller/Kowley (1964) between anxiety and intelligence scores is not significant and the relationship between anxiety and academic achievement is in most cases negative. The multiple correlation obtained between intelligence and anxiety with academic achievement indicates that manifest anxiety does not seem useful in predicting school achievement.

But other investigators have views contrary to the above
findings. Burgess (1956) has shown that over-achievers are characterised by an optimum amount of anxiety. Miller and Dollard (1941) states that anxiety is an essential condition for effective learning. According to them anxiety can have positive healthy values and can serve as a challenge to spark intelligence and creative behaviour. Furnmeaux (1962) obtains anxiety to be positively correlated with achievement in University students.

The relation between anxiety and achievement or intelligence has been pointed out by many to be curvilinear on the basis of drive level theory and Yerkes - Dodson law. (Lynn, 1958; Furnmeaux, 1961; Furnmeaux and Savage, 1962). The law points out that performance on a task improves as drive-level is increased up to a value that is optimum for the task concerned, beyond which increments of drive are often associated with progressive falling off in performance and behaviour becomes maladaptive.

The hypothesis is tested in performances of subjects on intelligence tests as well as in academic tests. Evidence for the curvilinear relationship between anxiety and intelligence has been found by Sarason and Mandler (1952) and also by Lynn and Gordon (1961). Savage (1962) has obtained some evidence of an optimum level of anxiety in the case of academic

ENVIRONMENTAL FACTORS

A considerable number of research studies have been conducted in the past to determine the impact of environmental factors on academic achievement. Many of these have revealed a clear and definite association between scholastic performance and certain factors in the personal, family, social and academic background of the student. A brief review of such studies is presented below.

Mishra, Dash and Padhi (1960) report a correlation of 0.59 between home environment and school achievement whereas correlation between intelligence test scores and academic achievement is found to be 0.31.

Clark (1927) states that students whose parents have college education rank high in scholarship. Shuttleworth (1927) finds occupation of parents related to academic success of students. But according to Nemzek (1942) education of parents and their profession have no influence over the
academic success of their children. On the other hand, Floud et al. (1966) maintain that educational level of parents is positively and significantly related to academic achievement of their children. Educated parents are markedly more interested in and ambitious for their children's education than are parents who lack education. Sinha (1956) records failing under-graduates to have less well educated parents than those who graduated.

Chauncey (1929) records that there is positive relationship between academic achievement and socio-economic status and that this relationship holds good even when measured intelligence is held constant. The investigations of Garrison (1932); Coleman (1940); Shaw (1943) and Gough (1946) have indicated the existence of a definite relationship between socio-economic status and academic achievement. Ames (1943) and Abrahamson (1952) report positive relationship between socio-economic status and scholastic success. Campbell (1952) also finds positive relationship between academic achievement and socio-economic status. Frankel (1953) in a study of high ability school boys concludes that home and family background and socio-economic status are significantly and positively related to academic attainment. Coster (1959) holds that those who successfully complete their course in school come
from homes of high economic level. Dugan (1962) observes that poor socio-economic status often causes scholastic failure. Curry (1962) points out that as intellectual ability decreases the effect of socio-economic conditions on academic performance increases greatly. Lindgren and Guedes (1963) find that social status (as indicated by educational level of parents) intelligence and academic success are positively inter-correlated.

Astin (1963) observes that educational and occupational level of parents, degree of family support and number of books at home have a direct bearing on the academic achievement of students. Lord Robbins and his colleagues (1963) emphasize the role of environmental advantages and disadvantages in scholastic performance of the student. Close association between father's occupational level and the educational achievement of children at school has been observed. Economic circumstances of the home constitute a very influential factor as also the educational background of the parents. The report concludes that the degree to which children experience an academic environment at home has a major influence on whether they make the best of their talents. A controversial view is presented by Smith (1965) who points out that the profession of parents has no relationship with scholastic performance.
of their children. According to him financial status also has nothing to do with the achievement of students. On the other hand Chopra (1969) records significant positive relationship between socio-economic status and scholastic attainment and this relationship holds good even when measured intelligence is kept constant. He reports that achievement in English, mathematics and the physical sciences is positively related to social background but achievement in Hindi, biology and art is relatively free from the influence.

McQuary (1953) observes that educational level of parents, occupational level of father, number of siblings, position among siblings, extra-curricular activities, number of illnesses or diseases, hours studies per week are some of the factors related to the scholastic achievement of pupils.

The Flowden report on Primary Education (1967) makes it clear that, so far as children are concerned, home circumstances including physical amenities of the home or the lack of them, the occupation and income of father, the size of the family, the length of parents' education and the qualifications they have obtained, all these account for only 9 per cent of the variance in educational performance of primary school children. Parents' attitude on the other hand accounts for 20 per cent of the variance. The criteria of parents' attitude include interest in children's home work, time spent with children.
in evenings and general literacy of the home as assessed
by kinds and amounts of reading, and library membership.

Birth and family size have attracted the attention
of many researchers. Griffiths (1926) observes close rela-
tionship between school grades and size of families. Harris
(1940) records many conflicting findings in literature, on
family size and birth rank in relation to academic per-
formance. Douglas (1964) reports that children from large
families tend to perform relatively poorer in school when
compared to those from smaller families and that the eldest
child seems to stand out as superior in achievement as cited
by Galton who in 1874 had noted that distinguished men of
science were more often eldest or only sons than younger ones.
Galton qualified this by saying that eldest sons were more
likely to become possessors of independent means and able to
follow their interests more freely than younger ones. He
also thought that they were more likely to be treated as
companions by their parents and to have earlier responsibility
and that "probably also the first born of families not so well
to do in the world would generally have more attention in
infancy, more breathing space and better nourishment than
his younger brothers and sisters". Loe (1953) stresses that
nearly two thirds of her sample of eminent scientists were
erlder children and most of the remainder either first born
sons and the rest were born after a long gap since the older sibling was born. There was an age gap of five years between them and their next elder brothers. Roe hypothesizes the same as Galton eighty years before, that the reason for supremacy of eldest sons is that they develop independence more than younger siblings, suggesting additionally that they do not suffer from baffling failure to do things which their older siblings can do and that "when there are enough years between them, competition is not acute in the same way and it is much more easily taken for granted that the older brother is stronger or can do things the younger brother cannot". These are only hypotheses and much progress has not been made on this question since Galton, but on the evidence cited, there seems to be some link between birth rank and attainment. Floud et al (1956) have recorded that number of children in the family is inversely related to scholastic success.

Kimball (1953) holds under-achievers in general to have poor father relationship. Malloy (1955) finds that parents of high achievers have more positive attitudes. Drews and Teahan (1957) state that mothers of high-achievers are more authoritarian and restrictive in the treatment of their children, than mothers of low-achievers.

Turner (1927), Feingold (1928) and Burton (1945) point out a direct relationship between low scholarship and poor
attainment in the classes. Jones (1931) also reports a positive relationship between attendance and grades. Finch (1935) observes that the relationship between attendance and scholarship is low but positive. In some studies parental discord and broken homes seem to have no effect on grades, but in a study of Merrill (1964) there is evidence that students who have experience of unstable and discordant family relations are more likely to fail.

The extent to which participation in co-curricular activities per se affects academic performance is obscure. Conflicting findings are reported in literature. Harris (1940) after reviewing many studies maintains that there is no general relationship, though some studies report to the contrary. Thompson (1927) points out that participants in athletics rank higher scholastically than non-participants. On the other hand Bear (1928) considers non-athletes to have higher scholarship than athletes. Hutchinson (1929) also agrees with Bear’s observation. He records that athletes of high ability are very often low in scholarship. Eckert (1935) reports that superior students rarely take active part in athletics. Mehus (1954) states that good students engage themselves in debates, oratorical contests and so on, while poor students take part in athletics, dramatics etc.
Crawford (1928) holds co-curricular activities to be negatively correlated with academic success. Gerberich (1941) also maintains low-achieving students to be more engaged in extra-curricular activities, thus spending less time in studies. In Gray and Short's (1961) sample, a group of engineering students who took part in athletics, performed least well, as did the student teachers in the Derbyshire report (1968). But according to Knox and Davis (1929) and Monroe (1929) those who participate in extra-curricular activities rank higher scholastically than those who do not. Mehus (1952) stresses that failures in school are more attributable to factors other than outside activities.

Himmelweit (1951) has stated that unsuccessful students participate less in social activities than successful students and Lucas, Kelvin and Ojha (1966) have obtained a similar result. But Owens and Johnson (1949) on the other hand find under-achievers and unsuccessful students to be socially too active to spend enough time with books. Malleson's (1960) observations corroborate with the above. He maintains that students who isolate themselves socially achieve more first class degrees and fewer poor degrees than those who take a great part in Union affairs. Morris (1964) emphasises that students who are active in union affairs, societies or sports were notorious for academic failures.