CHAPTER II

A Brief Review of the Related Studies

Intelligence and Achievement

A good number of studies of varying nature have been made at the school and college level to discover to what extent intelligence contributes to the success of a student in his scholastic achievement. Chauncy (1929) found a correlation of 0.593 between intelligence and achievement of 9th-grade students. With the age held constant, the correlation was reduced to 0.553. John (1930) collated the results of almost 400 studies, conducted at the elementary school level, all indicating high positive correlations, averaging around 0.6, between I.Q. scores and achievement scores. The detail is given in the Table 1. It was found by Murray (1938) that the tests of intelligence were correlated with a criterion of success in the secondary schools to the extent of 0.70. Cohler (1944) studied a group of elementary school children and found a correlation of 0.58 between the mental age and the achievement age. McClelland's study (1942) showed that a combination of intelligence, a qualifying examination and the teacher's estimates could predict success in senior secondary schools to the extent of 0.804. According to Emmett (1945), intelligence came to be the best predictor of achievement. The multiple correlation of the battery (Murray House Tests—a battery of three) with the teachers' assessment was about 0.743.

Pinter (1945) brought together a table of correlations, showing the relationship between intelligence-test scores and high-school marks. These coefficients ranged between 0.29 and 0.60, with a few below 0.40. Louttit (1947) reported median coefficients of correlation between intelligence-test scores and achievement in different
Table 1. Summary of reported correlations (by John) between intelligence and achievement for the elementary grades

<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Study Code number</th>
<th>School grade</th>
<th>N.</th>
<th>Number of z's</th>
<th>Range of ( r )</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>43</td>
<td></td>
<td></td>
<td>106</td>
<td>0.51 to 0.72</td>
</tr>
<tr>
<td>5</td>
<td>43</td>
<td></td>
<td></td>
<td>57</td>
<td>0.13 to 0.91</td>
</tr>
<tr>
<td>8</td>
<td>43</td>
<td></td>
<td></td>
<td>306</td>
<td>-0.15 to 0.91</td>
</tr>
<tr>
<td>-</td>
<td>31</td>
<td>4</td>
<td>25</td>
<td>1</td>
<td>0.71</td>
</tr>
<tr>
<td>-</td>
<td>31</td>
<td>6</td>
<td>156</td>
<td>1</td>
<td>0.66</td>
</tr>
<tr>
<td>-</td>
<td>31</td>
<td>6-8</td>
<td>60</td>
<td>1</td>
<td>0.79</td>
</tr>
<tr>
<td>-</td>
<td>20</td>
<td>7-8</td>
<td>140</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>-</td>
<td>20</td>
<td>6</td>
<td>140</td>
<td>1</td>
<td>0.81</td>
</tr>
<tr>
<td>-</td>
<td>9</td>
<td>8</td>
<td>113</td>
<td>1</td>
<td>0.57</td>
</tr>
<tr>
<td>-</td>
<td>16</td>
<td>8</td>
<td>76</td>
<td>1</td>
<td>0.64</td>
</tr>
<tr>
<td>-</td>
<td>7 (age) 7-14</td>
<td>689</td>
<td></td>
<td>1</td>
<td>0.73</td>
</tr>
</tbody>
</table>
In a study, Carter (1948) measured study habits, intelligence and achievement. The investigation showed that the test did discriminate between successful and unsuccessful students. The highest correlation of 0.78 was found to be between intelligence and achievement. Gough (1949) originally suggested that three sub-scales, namely Ie (intellectual efficiency), Ac (achievement via conformity) and Al (achievement via independence), would be especially related to school achievement. Lennon (1950) investigated the relationship between achievement and mental ability by employing standardized Metropolitan Achievement Test and the Pinter General Ability Test. He found a correlation (the average of correlations for the subjects) of 0.67 in grades VII and IX and of 0.72 in grade VIII. Ellis (1951), reported that differences in achievement were due to differences in I.Q. and in associated mental age. He has given a range of correlations from 0.40 to 0.75. Lindquist (1951) has reported that the median correlation of tests, such as the CEEA Scholastic Aptitude Tests, with freshman grades falls near 0.45.

Cain et al. (1952) have summarized the results of a number of research studies. Some of their important observations are given below:

"The instruments most widely used for predicting general scholarship at the secondary school level is still the intelligence test. The average correlation of intelligence and high school achievement in general is slightly less than 0.50. For more than 300 coefficients of correlation..."
gleaned from the studies concerned with the relationship between intelligence and achievement in various school subjects, the medians were calculated: Science 0.44 and Mathematics 0.37."

Peal & Rutter (1954) used unstandardized tests in intelligence, English and Arithmetic and Moray House tests of intelligence. They studied ten batches of children entering a single grammar school between 1934 and 1943. The children appeared in the school certificate examination five years later. The criterion of success was a composite of school certificate results in the English language, English literature, Mathematics and Geography. With the entry groups of 1940-43, the predictive values of Moray House intelligence tests were 0.63, 0.43, 0.62 and 0.66 respectively. They found that the standardized intelligence test was the most efficient predictor.

Many studies (Wolking, 1955; Shinn, 1956; Wallman, 1957) have related measures of I.Q. to measures of achievement and such studies on the average indicated a correlation of approximately 0.70 between I.Q. and achievement. But Holland (1958) stated that SAT (Scholastic Aptitude Test) has low efficiency for predicting the grades of high aptitude sample within a narrow range of talent. Rossi et al. (1959) analysed the studies reported on the relationship between intelligence and achievement at the high-school level by Lee & Lee (1936), Woody (1944), and Chauncey (1929). The summary of the correlations between intelligence and high-school achievement in different subjects is given in Table 2 and the important observations of this analysis are given below.

*The massive finding under this category is that a
Table 2. Correlation between intelligence and high-school achievement, as reported by Rossi et al.

<table>
<thead>
<tr>
<th>Achievement test</th>
<th>Number of r's</th>
<th>Lowest r</th>
<th>Highest r</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>9</td>
<td>0.33</td>
<td>0.66</td>
</tr>
<tr>
<td>Mathematics</td>
<td>11</td>
<td>0.33</td>
<td>0.69</td>
</tr>
<tr>
<td>Social Studies</td>
<td>26</td>
<td>0.25</td>
<td>0.74</td>
</tr>
<tr>
<td>Modern Language</td>
<td>5</td>
<td>0.16</td>
<td>0.33</td>
</tr>
<tr>
<td>Latin</td>
<td>5</td>
<td>0.17</td>
<td>0.39</td>
</tr>
<tr>
<td>Science</td>
<td>3</td>
<td>0.30</td>
<td>0.52</td>
</tr>
<tr>
<td>Commercial</td>
<td>4</td>
<td>0.01</td>
<td>0.10</td>
</tr>
<tr>
<td>Home Economics</td>
<td>3</td>
<td>0.12</td>
<td>0.41</td>
</tr>
<tr>
<td>Industrial Arts</td>
<td>3</td>
<td>0.10</td>
<td>0.16</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>2</td>
<td>0.22</td>
<td>0.30</td>
</tr>
<tr>
<td>Total Achievement</td>
<td>1</td>
<td>0.59</td>
<td>0.59</td>
</tr>
</tbody>
</table>
student's intelligence relates more strongly to his achievement level than to any other characteristic. Surveying the large number of studies it was found that between forty and sixty per cent of the variance among students could be accounted for by variations in the I.Q. levels. Furthermore, holding the I.Q. constant, the correlations between achievement and other characteristics are uniformly reduced in size. This finding holds good for both the elementary and high school levels.

In a study by Rowland (1959), the grade-point averages were found to be related to the scores on American Council on Education (A.C.C.E.) psychological examinations to an extent of 0.41–0.63. Froehlich & Hoyt (1959) have given an overall picture and stated:

"In general, studies indicate that when these two measures (intelligence and achievement) are correlated, the coefficients can be expected to range from 0.30 to 0.80, with most of them at or near 0.55, the middle of the range."

Fleschera (1963), Klinemeier & Weirme (1964) and Edwards & Tyler (1966) found that there was a high correlation (about 0.70) between I.Q. and achievement. Cough (1965) used the achievement via conformity and achievement via independence scales, with positive weights, and flexibility, with a negative weight, to predict academic achievement in a sample of Italian School children. Snider (1966) and Linton (1967) found that the CPI (California Psychological Inventory) distinguished achievers from un-achivers in a Canadian high school setting. Ryback (1969) cited several studies which would
indicate that the CPI could be used by educators in a number of ways to predict academic success. Hughes (1968) stated that reading, copying strength and comprehensive copying strength were highly comparable with the variables of I.Q. and reading achievement in the prediction of grades. Stroup (1970) cited several studies which would indicate that the CPI could be used by educators in a number of ways to predict academic success. In a study by McCandless & Roberts (1972), intelligence and standardized achievement test standing have a correlation of 0.45 for the total population but of -0.35 for advantaged white boys and of 0.80 for disadvantaged white girls. Crone et al. (1972) found composite score relationship of the synchronous unlagged I.Q. and achievement tests. The correlation between these contiguously administered tests is positive and significant at both measurement periods (r=0.781 and r=0.770). It was also found that among suburban students, the intelligence -causes- achievement on a consideration of composite scores clearly predominated.

Jacobs (1959) found that the differential aptitude test (DAT) and the verbal reasoning test were correlated significantly with grade-point average (GPA). Norton (1959) found the total DAT battery to be significantly related to Science achievement. Frankel (1960) suggests that scholastic aptitude tests can be regarded as the most satisfactory predictor of academic success. He found that achievers (those whose school performance was commensurate with their intelligence) have a significantly higher score on verbal reasoning and numerical ability than the under-achievers (those whose academic performance was poorer than their intelligence scores). Using a Negro sample, Green & Farquhar
(1965) found that verbal aptitude and GPA had a relatively low correlation, but for the white sample, the correlation was positive and high. The low correlation between verbal aptitude and achievement may also be taken as an explanation for the low achievement of the Negroses.

Davis (1951) found that attitudes towards school (not specified further) correlated 0.32 with achievement but only 0.12 when the I.Q. was held constant. Rossi et al. (1959) felt that attitudes towards school and school work also had been found to play some role in achievement, but this role was considerably reduced when intelligence was taken into account. They have summarized the findings of the different studies on the correlations between the total achievement and the various attributes for the 8th grade, as given in Table 3. Du Cete & Volk (1972) stated that a relationship did exist between student attitudes and achievement, but that this relationship was moderated by intelligence.

According to Anderson's (1960) ability-gradient theory, the I.Q. could be expected to have an effect on academic achievement up to a certain threshold— I.Q. level, where further increases in the I.Q. would have no further effect on achievement, but where creativity would begin to have an effect (such a situation be a special case of interaction between the I.Q. and creativity variables). Yamamoto (1961) also found that the I.Q. beyond 120 had no effect on the academic achievement of high-creative group. Holland (1961) reported that creative performance was generally unrelated to scholastic achievement and aptitude among students of superior scholastic aptitude. Ahrens (1962) obtained lower creativity-achievement correlations from a 'normal' I.Q. group than from studies with high-I.Q. groups. Getzels & Jackson (1962) demonstrated that a group of individuals whose measured
Table 3. Correlations between achievement and various attributes for the 8th grade

<table>
<thead>
<tr>
<th>8th grade pupil attributes</th>
<th>Zero order r</th>
<th>Achievement variance explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.496</td>
<td>0.246</td>
</tr>
<tr>
<td>I.Q.</td>
<td>0.571</td>
<td>0.325</td>
</tr>
<tr>
<td>School attitudes</td>
<td>0.320</td>
<td>0.102</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>0.240</td>
<td>0.058</td>
</tr>
</tbody>
</table>
creative ability was in the top 20% of their school and whose measured intelligence was in the lower 80% was equivalent in achievement to a group whose measured intelligence was in the top 20% and whose measured creativity was in the lower 80%. (But both groups were superior in achievement to the population from which they were drawn.) Torrance (1962) found that only six out of eight replications confirmed Gottleb and Jackson's results. The existence of an I.Q. threshold was also contraindicated in studies showing strong correlation between measures of intelligence and academic achievement for high-I.Q. groups (Hosteller, 1963).

Cisaroli (1965) found that when the effects of I.Q. were statistically controlled, there were significant correlations between a composite creativity score and reading, arithmetic and language achievement. Wallack & Kegan (1965) reported a number of significant relationships between achievement and the I.Q. scores, on the one hand, and fluency and originality measures, on the other, among elementary school pupils. Edwards & Tyler (1965) found that students with the I.Q. scores in the upper third of their sample had higher achievement scores than pupils who were in the upper third on creativity measures.

Feldman et al. (1965) reported significant correlations among standard achievement scores in Mathematics, Science, Social Studies and Reading, verbal and quantitative ability measures, and tests of originality, ideational fluency and flexibility among junior high school pupils. Feldman et al. (1971) concluded from a study that there were significant relationship among creativity scores, intelligence scores, and academic achievement.
Willham et al. (1971) reviewed studies on the relationship of intelligence to conceptual learning and stated that performance was contingent upon the complex interaction of subject variables and the organization and structure of learning tasks. Clifford & Cleary (1972), in a study, found that at each grade level, there was a significant positive correlation between internality and performance. For boys, this relationship was stronger than that found between performance and I.Q.; for girls the I.Q. correlated more highly with performance than did internality.

At the college level, studies by Thurstone (1925), Mochall (1925), Toops (1926) and Ede & McCall (1933) have reported a low but significant correlation, ranging from 0.315 to 0.600, between intelligence and scholastic success. Butsch (1939) has suggested that by assigning differential weights to the components, theprediction of success could be improved in the courses of Engineering, Journalism, Business Administration and Liberal Arts. A review of the literature from 1930 to 1937, concerning factors affecting college grades was published by Harris (1940). He concluded that the correlation between intelligence and grades ranged from 0.33 to 0.64. Rosenfield & Namzak (1939), Keys (1940) and Billhartz & Huston (1941) found correlations ranging from 0.21 to 0.35 between general intelligence and college grades. Harton & Sprow (1941) and Durflinger (1943) have also reported a significant correlation between intelligence and scholastic success.

Crawford (1946) stated the possible general conclusions that "typical correlations with school or college averages which run between 0.40 and 0.50 is a rough, though fair generalization; considerably lower or higher coefficients than usually found
have at times been reported even for identical measures in different administrations.*

Travers (1949) has stated that, in general, multiple r's of 0.6 or 0.7 are obtained at most universities between freshman grades and predictive batteries comprising secondary school grades achievement and tests of intelligence or scholastic aptitude. Brown (1950) found the correlation between the grade-point averages (GPA) and the total scores on the American Council on Education psychological examinations to be 0.40. Carter (1950) reported that intelligence influenced academic achievement significantly, the correlation being about 0.51.

A study made by Frederikse & Schrader (1952) gave a median correlation of 0.47 between ACE psychological examinations and the first-year grade averages for male veterans of eleven colleges. Hoerree and David (1954), Grater & Thalman (1955) and Stephane (1956) have also reported a correlation in the vicinity of the above figure. Ahmann et al. (1958) have reported a correlation of 0.08 between SSHA and the first-semester grade-point averages. Kennedy (1958) reports a correlation of 0.64 for the verbal part of SCAT (School & College Ability Test) and 0.63 for the total score in predicting college achievement in terms of the grade-point averages. O'Neill (1959) in an investigation found correlations ranging from 0.26 to 0.67, with an average of 0.40 between I.T.E.D. (Iowa Tests of Educational Development) and college success at the end of the first year. Holland (1959) found that a number of C.P.I. scales correlated at the 0.01 level with the grade point-averages.
for boys. In one study of Henderson & Malung (1959), an attempt was made to predict the success of college freshmen on the basis of ACE psychological examinations. The correlation between GPA and scores on ACE examinations was found to be 0.58. Jackson & Pacini (1961) found six scales to be good predictors of college success, whereas Griffin & Flaherty (1964) found that nine scales were correlated significantly with freshman grades at a college for women. In a study Stroup & Elt (1969) and Stroup (1970) tried to establish the California Psychological Inventory as a predictor of college academic success.

**Emotional Maturity and Achievement**

The recognition of the importance of personality factors of non-intellectual nature in scholastic performance has stimulated a wide variety of investigations. Burt (1917) and Terman (1925) thought that psychoneurotic traits were a handicap in academic work. Richmond (1929) found emotional maladjustment to be more often associated with poor performance. Evans (1930) reported no correlation between success in college and emotional stability, whereas Keys & Whiteside (1930) found that there was no tendency for nervous instability to go with school standing. White (1932) found that poor achievers were often handicapped by mental disorders of an anxiety type.

Stagner (1933), reviewing a number of studies, found only negligible relationships between the personality tests and the grade averages, but felt that high emotionality tended to lower
achieved. Thompson (1954) found that psychoneurotic scores were only slightly correlated with achievement. Namzak (1930) used Bernreuter Inventory but found no relationship with the teachers' grades. Prescott (1938), Crow & Crow (1942) and Mangues & Woodward (1949) stressed the importance of emotional factors in scholastic success. Fischer (1943) concluded that emotional maladjustment and frustration led to greater under-achievement. But no significant results were obtained in a study of college students by Griffiths (1945). Assou & Levy (1947) found personal adjustment to be positively related to scholastic achievement. Ovane & Johnson (1949) and Gough (1949) found that under-achievers exhibited symptoms of neurotic nature.

Martin (1952) held personal maladjustment bordering on neuroticism as a characteristic of failing students. Gough (1953) reported quasi-neurotic trends among over-achievers. Hoyt & Wrenn (1954) failed to show any difference in the overall adjustment between over- and under-achievers. Burgess (1956) found over-achievers to be more emotionally inhibited and less labile affectively than under-achievers. Berger & Sutker (1956) found that students with high intellectual capacity and adequate personality adjustment achieved superior academic performance. Bishton (1957) concluded that the characteristics of adolescence placed greater emphasis on the pupils' achievement in terms of social and emotional factors. Furneaux (1957) reported a positive correlation between neuroticism and attainment among university students. Schneiders (1957) held emotional maturity to be the most important non-intellectual factor, prognostic
of success in college. Lynn (1957) found some evidence that anxious children tended to be good readers, but Saranoff et al. (1959) found no such association between anxiety and attainment.

Froshlich & Hoyt (1959) held that under-achievement is most often a sign that something is out of gear in the adolescent's life or environment. Middleton & Guthrie (1959) summarized the results of many studies and concluded that the principal difficulty was probably the heterogeneity of the criteria, the antiquity of the personality measures used and the non-summative or non-linear predictions and that there was now quite a substantial amount of literature relating personality factors to school achievement. Heilbrun (1960) concluded that students with several emotional difficulties would be less likely to succeed than those without such handicaps. Sutton (1961) found that men with brilliant scholastic records were often not better emotionally adjusted than those with low academic achievement. A definite relationship was found to be existing between the levels of achievement and the related adjustment factors by Canti (1962). Feldhusen & Klausmeier (1962) and Philips (1962) found a negative correlation between anxiety and academic achievement.

Whereas Sudin (1965) and Robinson (1966) reported anxiety to have a positive effect on academic achievement, Cattell & Butcher (1968) also met with considerable success in indicating the importance of personality factors in school achievement.

Duranyjays & Such (1971) have indicated that the tests of mental ability and maturity are most related to educational
placement. Haddad & Pella (1972) stated that a functional linear relationship seemed to exist between the grade level and the understanding of the conceptual schemes of relativity. Barton et al. (1972) reported the importance of ability and personality variables in the prediction of school achievement. They show that different personality variables (like adventurousness, anxiety and emotional stability) are significantly related to Mathematics, Social Studies, Science, etc. Glick (1972) indicated that measures of student adjustment constituted the strongest predictor of language achievement. Flock & Robinson (1972) stated that psychometric feedback did not lead consistently to improved performance.

The Socio-Economic Status and Achievement

Clark (1927) found that students whose parents had college education ranked higher in scholarship. Bear (1929) found that the occupation of the parents was related to the academic success of the students. Chauncey (1929) in a study concluded that the correlation between achievement and intelligence was but little influenced by age and socio-economic status. In Coleman's study (1940), the correlation between the socio-economic status and achievement was found to be 0.300 in the eighth and 0.353 in the ninth grade. However, when the I.Q. or the chronological age or both were held constant, the correlations between SES and achievement were sharply reduced, but less so in the 9th than in
the 8th grade. Nemzek (1940) reported that the education of parents and their profession had no influence on the academic success of their children. Terman & Odén (1947) found that the under-achievers came from homes where the parents had lower education than the parents of achievers. The National Opinion Research Centre (1947) established that the perception of the occupational prestige hierarchy was positively related to the socio-economic class. Another study by Davis (1951) reported a correlation of 0.24 between SES and the 8th grade achievement.

Kimball (1953) found that under-achievers, in general, had poor father-relationships. Malloy (1955) found that parents of high-achievers had more positive attitudes. Baillie (1956) reported that there was an availability of high-level talent in the lower socio-economic groups, but problems existed in developing this talent, because many lower-class individuals did not attempt to get the necessary education or the training needed for high-level jobs. Drews & Teahan (1957) revealed that the education, values and attitudes of parents also had an important bearing on academic performance. The occupation of the parents was found to be related to the academic achievement of intellectually superior children in a study by Bialston (1957). Garberich (1957) found a correlation of 0.437 between achievement means and Home Index (an instrument which takes into account the style of life as well as the income, occupation and education) means for students in 55 Connecticut towns. Furthermore, this socio-
economical variable correlated with achievement even when the
I.Q. was partialled out. Rossi et al. (1959) established that the
differences among individuals were also accounted for by SES, i.e., the higher the occupation of the bread-winner in the student’s family, the greater his level of achievement.

Frankel (1960) found that the fathers of the achievers had more of formal education than their mothers. The under-achievers, on the other hand, had a significantly greater number of working mothers in the jobs, such as typists, clerks, receptionists. Frankel (1960) found the socio-economic status to be positively related to academic success. The achievers belonged to a significantly higher scale of socio-economic strata. According to Gris (1960), many differences exhibited by the preschool children are the result of learning and can be attributed to the environment in which the children are raised. Impellizzeri (1961) has stated that there is a correlation between the socio-economic status and the ultimate scholastic success. The educational background of the parents and the occupational level of the student’s father have also been found to be related to the academic performance of the children. In a study by Pierce & Bowman (1962), the hypothesis that the high-achieving students come from homes with a higher socio-economic status than the low-achieving students was supported for the tenth-grade girls, but rejected for the tenth-grade boys. Curry (1962), using a more elaborate design, observed that the socio-economic status had relatively no effect on
children with higher I.Q. But the children coming from the higher 
SES had better scores on the whole and specially so in language. 
The lower-intelligence group was most affected by SES. The disadvantage 
was shown in language, reading and total achievement. Arithmetic 
was least affected. On the whole, as intelligence decreased, the 
adverse effects of SES became severer.

Lindgren & Guedes (1963) obtained a significantly 
positive relationship between the parents' education, social status 
and school marks. It has been found by Ausubel (1968) that typical 
relationships between the social status characteristics and the 
ability scores are represented by a correlation coefficient of 
0.35. Jagen (1968) has shown that SES is correlated 0.35 to 0.40 
with the I.Q., the high-SES children having higher I.Q. than 
their lower-SES peers. Tseng & Thompson (1968) found that the 
students of a lower class tended to select lower-level occupations. 
Edwards (1968), quoting a number of studies in an article, has shown 
that the relationship between favourable attitudes and SES is 
far less marked than is the relationship between I.Q. and SES. Vernon 
(1969) stated that there was only a limited support for the 
hypothesis that masculine dominance in the home and the encouragement 
of initiative were associated with perceptual-spatial abilities. 
The findings of Anderson & Evans (1969) indicated that the variables, 
such as sex, father's education and the socio-economic level, 
were predictive of achievement in Mexican-American youth, just 
as they were in other groups.
Subnormal children from the low socio-economic status often appear to be brighter than those from middle and high SES. Moreover, the I.Q. did not predict the associative learning ability of low SES subjects nearly as well as it did of high SES subject. This has been shown in several studies (Jensen, 1970). Guthrie (1971) in a study concluded that the high-SES subjects were noticeably superior to the low-SES subjects on all treatment conditions. Tseng (1971) supports the contention of other social scientists that certain personality variables are related to the SES. According to Harjoribanks (1972), the environment measure counted for a large percentage of the variance in verbal number, and the total ability scores and a moderate percentage of the variance in reasoning ability scores. The average correlation between the social status characteristics and the ability scores was 0.38. Glick (1972) stated that research had clearly demonstrated that the children of all socio-economically depressed ethnic groups manifested deficiencies in achievement. Stedman & Adams (1972) support the view that the SES and some other factors are predictive of achievement. Anderson & Hanrahan (1972) indicated generally a higher I.Q. for subjects from higher socio-economic levels. It was observed by Orm & Das (1972) that, whereas in the average I.Q. level, the high-SES sample did better than the low-SES sample, in short memory this was reversed in the low-I.Q. level.
Indian Studies

Intelligence and Achievement

Similar studies, as reported already in this chapter, have also been conducted in India. Studies showing the relationship of school marks with intelligence were undertaken by Shivaramayya (1947), Richaria (1952), Sirivastva (1955), Bhargava (1957), Parekh (1957) and Singh (1957). All, except Sirivastva (1955), found the correlations to be significant. Chothia (1956) and Dosajh (1958) found similar results on the prediction of success in schools. Dosajh calculated correlations between progressive matrices and three school subjects (Mathematics, General Science and Language) of boys and girls who appeared in the Middle Standard Examination in 1958. These have been 0.6 for Mathematics, 0.6 for General Science and 0.39 for the First Language. A study made by Chothia (1956) bearing on the prediction of success in multipurpose schools also presents almost similar results. Shukla's correlations (1956) between intelligence and scholastic achievement in Gujarati, English, Second Language, History, Geography, Mathematics and Science of the S.S.C. Class have been respectively 0.71, 0.52, 0.53, 0.46, 0.45, 0.62 and 0.46. Rai (1958) reported the following correlations between intelligence and different subjects of class VIII: Hindi 0.59, English 0.54, History 0.47, Geography 0.45, Math., 0.38 and Arts 0.02.

Jesvar (1958 & 1959) attempted to find the relation between intelligence & study habits and intelligence & achievement.
The results of the investigations revealed a positive correlation of 0.143 between study habits (progressive matrices) test and examination marks, significant at 0.01 level, and he found a 'r' of 0.34 between intelligence (Mohsin's verbal Intelligence Test) test scores and achievement. He also reported a low and insignificant correlation of 0.144 between study habits scores and intelligence scores. In both these investigations, the factor of intelligence, which correlates very high with achievement, has not been properly controlled. Dash (1959) has stressed the importance of intelligence in achievement. Mishra et al. (1960) reported a correlation of 0.31 between intelligence test scores and school achievement. Parhi (1960), Satsangi (1960) and Kapoor (1961) found a significant correlation between intelligence and school marks.

In a study by Kundu (1962) scores on three intelligence tests (abstract intelligence test, intelligence test, concrete intelligence test) were correlated with scores in Bengali, English, Hindi, Sanskrit, Mathematics, History, Geography and Science. The correlations ranged between -0.106 and +0.499. The importance of intelligence in academic achievement has been brought out by Tripathi (1962). Rao (1965) in a study of some factors related to scholastic achievement has found a correlation of 0.80 between I.Q. and achievement. Kumari (1965) and Uppal (1965) have also established a significant relationship between intelligence and achievement. Joshi & Pathak (1966) stressed the role played by general intelligence along with certain group factors in the performance of school subjects.
In a study, Hundal et al. (1972) have found that the correlation between the two measures of academic achievement and intelligence-test scores are positive and moderately high. Ramamurti & Malamas (1972) found a significant correlation between intelligence and achievement, and between intelligence and rigidity. A partial correlation between rigidity and achievement was calculated by partialling out the effect of intelligence. The correlation obtained was 0.39—a positive and significant correlation. While discussing fluid and crystallized intelligence, Singh and Hundal (1973) stated that both these abilities (intellectual development and skills & concepts) involved performances commonly said to indicate intelligence.

Datta (1952) and Dutta (1963) obtained a positive correlation in studies on the relationship of aptitude, attitude and interest with academic achievement, whereas Purandara (1961) found a low correlation between attitude (towards school subjects) and achievement.

Dutt (1955) recommended that the average of school marks of three years be accepted as a criterion for admission to a university, specially for borderline cases. Sharma (1958) and Sharma (1961) demonstrated the possibility of prediction of achievement in the school final examination from performance in the house examination. Pandey (1963) showed the futility of internal assessment in predicting success in the first year of the Engineering course. Mehdil (1965) investigated differential factors in pupils' success in Science, Art and Commerce courses at the higher secondary stage.
and demonstrated that differences did exist between the combinations of factors required for success in the three courses. His study brought out the utility of using tests of verbal meaning, inductive reasoning and numerical faculty for predicting academic success. He doubted the assumption that Science courses required a higher level of intelligence than the Arts and Commerce courses.

Chatterji & Mukherjee (1966) recommended the use of some objective measures, in addition to school marks, for better prediction. The Education Department of the Kerala University under the guidance of Pillai (1966) undertook a study to establish some factors affecting the achievement of pupils and made some useful suggestions. After a careful review of literature in this area, Dave (1968) found that in India only a few studies were concerned with the prediction of academic achievement at the school or college level. Joshi (1969) revealed a significant correlation between internal and external awards.

Chothia (1954) found a positive and significant bearing of intelligence on the prediction of success in colleges. Dutt (1956) found that the 'r' between B.A. (pass) and B.Sc. (pass) Degree examination composite scores and the higher secondary examination composite scores were 0.47 and 0.30 respectively. The qualifying examination composite scores correlated with the B.Sc. (pass) composite scores to the extent of 0.48. In a follow-up study by Mehrotra (1958), correlations between five psychological tests (BPT-S, Progressive Matrices, NIIP 70/23, Form Relations
and 8PST-1) and the aggregate scores of 115 students in the Intermediate Examination of 1957 were calculated and were 0.47, 0.29, 0.30, 0.25 and 0.40 respectively. The combination of more than one test of intelligence could not raise the multiple correlation beyond 0.486, whereas the 'r' obtained on the basis of one single verbal test of intelligence (8PT-8) was 0.470.

A battery of tests (composed of Paper Form Board Test, Abstract Reasoning Test, English Usage Test, Spelling Test and Vocabulary Test) was used for predicting college marks of Arts and Science students in a study made by Chatterji & Gupta (1960). The correlations ranged from 0.60 (between English marks and the test of vocabulary) to -0.295 (between Mathematics and Paper Form Board Test ) for the Science group. For the Arts group, the correlations ranged from +0.485 (between English Usage Test and English marks) to -0.550 (between Bengali and Abstract Reasoning Test). Low correlations were found by Rath (1959) between college marks of 275 graduate students and two intelligence tests, Progressive Matrices and Verbal Intelligence. The highest coefficient of correlation in this study was found to be 0.293 between Arithmetic marks and progressive matrices scores. It was found by Mallik (1961) that the previous examination results had no hope for predicting the future success.

Narayan (1962) found the pre-university examination to be the best predictor at the college level. He suggested that a combination of pre-university marks, the first-term marks, the scores on Raven's Progressive Matrices Test and the verbal test
of mental ability was likely to increase the predictive efficiency. Raina (1965), in an attempt to predict the success of teacher trainees, came to the conclusion that prediction could be improved by combining the matriculation marks with intelligence scores. Rastogi (1965) suggested that the prediction of achievement at the college level was improved on the basis of interest and intelligence-test scores. Kamat et al. (1966) showed that general ability could explain 55% of the variance by the factor-analysing marks obtained by 1,200 students.

Emotional Maturity and Achievement

Imagination and maturity as factors indicative of success in teaching were studied by Dasajh (1960). He found positive correlation coefficients of 0.71 and 0.80 between levels of imagination and maturity and skill in teaching respectively. Studies by Gadgil & Dandekar (1965), Chitkara (1961), Kamat & Deshmukh (1963) and Deo (1967) highlighted the factors responsible for academic achievement at the school and college levels. Bhatnagar (1965) established the fact that intelligence and personality were largely correlated factors. Sinha (1966) reported that low-achievers were observed to be more anxious, less well adjusted, more apathetic and despondent, less flexible and less original in expression than high-achievers. Joshi & Sharma (1967) listed the non-intellectual variables associated with under-achievers.

Madan (1967) (and many others also) found that the trend was that the introverts were more successful in academic work than the extroverts and also found neurotics to have poorer
performance in school and college work than the stable. Moreover, it was found that the combined effects of extroversion/introversion and neuroticism were more dependable in making prediction in academic success than in using either dimension alone. The combination of introversion with stability was found to yield better performance in both English and Indian samples and also at different age-levels ranging between 10 and 25 years (Ratan, 1967). Batnagar (1969) in a study, using Edward's Personal Preference Schedule, even failed to find a positive relationship between 'n' achievement and academic success. Rohan (1972) reviewed a number of studies relating to academic achievement and found that a vast number of personality traits correlate significantly with academic success. Shankar & Brar (1973) found that there existed a negative relationship between anxiety and academic achievement ($r = -0.32$). In girls, anxiety is highly and positively related with academic achievement ($r = 0.68$), but in boys anxiety is negatively related with academic achievement.

**Socio-Economic Status and Achievement**

In India, attempts have also been made to find out the relationship between the socio-economic status and achievement. Gadgil & Dandekar (1955) and Raghavacharyulu (1957) established the relationship of age, sex, rural background and SES, and family background with achievement. The study of Raghavacharyulu showed a high correlation between SES and achievement. The studies of Deb (1958), Sharma & Kalra (1960), Sinha & Misra (1960) and Sinha (1960) have explored the role of sociological and psychological factors in the success of students of Engineering. Misra et al. (1960) reported a correlation of 0.59 between home environment and school
achievement. Chitkara (1961), Kaur (1961), Choudhri (1963), Pairthraun (1963) and Sinha (1966) demonstrated the relationship of age, sex, rural background and socio-economic status, and family background with achievement. Chitkara and Kaur obtained a low relationship between social status and achievement, whereas Pairthraun obtained a high correlation. In a study reported by Jamuar (1963), twenty background factors were related to scholastic achievement. Background factors, like the father's occupation, hobbies, future educational and vocational plans of the students, were positively related to the school achievement of the secondary-school pupils. Rao (1966) found a correlation of 0.39 between SES and achievement and a correlation of 0.49 between SES and the I.Q.

Kaushal (1971) studied the effect of family patterns on achievement and concluded that poor economic standing of the family created a stimulus for better career orientation and competition than higher family economic levels. A reciprocal relationship between scholastic achievement, family pattern, conduct and college atmosphere exists, with social training and family pattern being influential factors. College friendships tend to be among students of similar family backgrounds, reinforcing the effect of the home on values, and providing feedback on the respective achievement of the students.

Mohan (1972) stated that nearly all the books on educational psychology stressed the relevance of the socio-economic status of the family on the subsequent performance of the children. The higher level of SES is usually understood to provide for greater
facilitation in education and also better opportunities for intellectual growth.

Hathur & Mundal (1972) found that there existed a close mutual relationship among factors of intelligence, achievement and family background. The correlations reported by them are between the parents' income and achievement, 0.41; between the parents education and achievement, 0.63; between the parents income and intelligence, 0.46; and between the parents education and intelligence, 0.79. They concluded that the higher the family income, the higher was the achievement and the higher the intelligence. Also, the higher the parents' education, the higher were the achievement and the intelligence of the children. Gupta (1973) summed up the outcome of a study to state that the parental occupation, the income status of the family and the facilities for studies (a table, a chair, etc.) provided to the child at home had a high relationship with his scholastic achievement. The higher the occupational status of the parents and the income of the family, the higher will be the level of the child's academic achievement and the better the educational facilities provided to the child at home the better shall be the achievement.

Sadami & Goawami (1973) found social adjustment to be significantly associated with school achievement, sex, and the level of parental education. The social adjustment of high-achievers was significantly superior to that of the low-achievers. Dutt & Sabharwal (1973) stated that the economic, educational and occupational levels of the father had a relationship with the achievement.
of a child.

A brief review of different studies in this chapter reveals that there are a large number of variables which directly or indirectly have some bearing on the scholastic achievement at the school and college levels. The importance of different personality and environmental factors have been emphasized in the three major fields of research reported here. But no specific or particular aspect of personality or environment or both has ever been established to be unequivocally related to academic success. No single variable would ever include all the determiners of a complex behaviour outcome as scholastic achievement. It is obvious that a single personality or environmental variable would be quite inadequate, as a combination of several might be actually involved in determining academic achievement. It is also clear that the predictors found useful at one level are not equally so at other levels. Variations of culture, place, time and technique also seem to play a very significant role.

Thus the inferences drawn on the basis of the studies so far reported cannot be regarded as general and final. It becomes necessary, therefore, to look afresh into the problems concerning the prediction of scholastic success relating to these three factors, as they face us. Hence this study has been undertaken with a view to making some contribution to the vast ocean of knowledge.

In the present study, an attempt has been made to locate the importance of intelligence, emotional maturity and socio-economic status as factors which have a significant relationship with scholastic achievement.