RURAL-URBAN DIFFERENCES AND INTELLIGENCE - SOCIO-ECONOMIC STATUS AND INTELLIGENCE - RACE OR CASTE DIFFERENCES AND INTELLIGENCE - INTERACTION AND CORRELATES OF PSYCHO-SOCIOCULTURAL FACTORS, AND INTELLIGENCE
REVIEW OF LITERATURE

The present study, being one aimed at studying the effect of some factors such as sub-cultures, socio-economic status and caste factors of subjects on their scores on Cattell's culture Fair Test (general intelligence), an attempt was made to survey the important studies in the area. A number of attempts have been made in foreign countries and a few in India to study the effect of these factors on intelligence. It is really a worthwhile attempt to pool the ideas of different sociologists and psychologists who have contributed their mite in the area. Such an attempt will definitely throw light upon the problem on hand, and help the investigator to go deep into the problem.

There have been countless new developments in the field of educational psychology in particular and psychology in general. Significant among them are: an interesting concern about the uplift of the culturally deprived segment of a population; education of the socially disadvantaged group; programmes that bridge the cultural gaps, and possible counteracting measures to minimize the cultural gaps and to maximize the
potential of our children, in turn raising the educational standards of the country. Since the dependent variable to be used in the study is the performance score of subjects on culture fair tests, the studies in which psycho-social factors have been considered in relation to the scores on tests like performance tests, non-verbal tests and culture fair tests of intelligence, are also considered as the related literature for the present study. The present study takes the cognizance of the reports and resources relevant to the problem. Hence the investigator decided at the outset to limit his survey to studies which cover the area already specified, and they are presented below.

SECTION I

RURAL-URBAN DIFFERENCES AND INTELLIGENCE

The relationship of intelligence test scores to rural-urban differences has been pointed out repeatedly by a variety of investigations in many different parts of the USA, Europe and India. Equally consistent results have been reported with respect to regional differences. Some of the studies have reported the fact that regional or rural-urban differences in
intelligence are either due to selective migration of intelligent individuals from rural to urban areas or from one region to another, or due to impoverished environment which prevails in rural areas. The important studies under this head are examined below in some detail.

McNemar's (1942) (As cited in Tyler, 1969:350) study is a fairly typical one of what is generally found in the area. Figures cited by McNemar from the Terman and Merrill standardisation data are shown in Table 3.1. Data present in the table are the mean scores obtained by various sub-culture groups of different age group subjects on Stanford-Binet Scale. Suburban averages are almost identical with urban averages.

**TABLE 3.1 IQ Data for Urban, Suburban and Rural Children (Mc Nemar, 1942)**

<table>
<thead>
<tr>
<th></th>
<th>(Age 2 - 5½)</th>
<th>(Age 6 -14)</th>
<th>(Age 15 - 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Sub-</td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td>Sub-</td>
<td>Urban</td>
<td>Sub-</td>
</tr>
<tr>
<td>N</td>
<td>354</td>
<td>158</td>
<td>144</td>
</tr>
<tr>
<td>M</td>
<td>106.3</td>
<td>105.0</td>
<td>100.6</td>
</tr>
<tr>
<td>SD</td>
<td>15.7</td>
<td>16.1</td>
<td>15.4</td>
</tr>
</tbody>
</table>

as would be expected from the fact that the American
suburbs are populated almost exclusively by city people. Rural children average about 10 or 11 IQ points lower at all ages except the lowest, for which the differences are only about 5 points. It is noteworthy, too, that there was a slight tendency for rural IQ's to drop at the beginning of the school period, no such tendency having been found among urban children (Terman and Merill; 1937 cited in Anastasi; 1976: 525). On the more recently standardised WISC, rural children again averaged significantly lower than urban children, the difference being somewhat larger on the verbal than on the Performance Scale (Seashore: 1951) (cited in Anastasi, 1976: 525).

In a study, Haviaghurst and Janke (1944) administered a battery of tests to 110 ten-year-olds in a Mid-Western Community and found that children classified as urban did better in all tests (verbal, non-verbal and performance tests) than rural children, with exception that the rural boys were superior in mechanical ability. Again in 1945, they analysed the data and found that there was a consistent tendency for urban children to do better than rural children on intelligence test battery.
Sarason and Gladwin (1958:119) have reviewed a number of studies available till that time. They have expressed in their review that persons, both children and adults, who live in cities are more "intelligent" than those who live in rural areas. The outstanding work in this area is that of Ginzberg and Bray on World War II and Korean War data. In 1953 Ginzberg and Bray published a book entitled "The Uneducated" and this book was reviewed by Sarason and Gladwin (1958). The review report reveals the fact that this book contains a searching and illuminating analysis of men who were rejected on grounds of mental deficiency for military service in World War II. From Table 3.2 it is found that gross differences in mental capacity exist among various racial, ethnic and regional groups.

<table>
<thead>
<tr>
<th>Region</th>
<th>Total</th>
<th>White</th>
<th>Negro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total US</td>
<td>40</td>
<td>25</td>
<td>152</td>
</tr>
<tr>
<td>New England</td>
<td>17</td>
<td>16</td>
<td>67</td>
</tr>
<tr>
<td>Middle Atlantic</td>
<td>15</td>
<td>11</td>
<td>67</td>
</tr>
<tr>
<td>South East</td>
<td>97</td>
<td>52</td>
<td>202</td>
</tr>
<tr>
<td>South West</td>
<td>60</td>
<td>54</td>
<td>107</td>
</tr>
<tr>
<td>Central</td>
<td>14</td>
<td>12</td>
<td>61</td>
</tr>
<tr>
<td>North West</td>
<td>14</td>
<td>13</td>
<td>40</td>
</tr>
<tr>
<td>Far West</td>
<td>10</td>
<td>9</td>
<td>50</td>
</tr>
</tbody>
</table>
The reviewers account this difference in rates of rejection as the difference that exists in the following aspects:

i) regional-cultural differences,
ii) minority group membership and
iii) rate of expenditure for educational facilities.

The rejection rates are very high in the case of South-East and South-West of the U.S.A. According to Ginzberg, these two regions comprise not only larger proportion of the rural population but also that of proportionally fewer larger cities. These studies of rural-urban differences which have also taken into account, the size of cities have shown a consistent correlation of this fact with test scores.

The concept of selective migration, which accounts for rural-urban differences in intelligence by assuming that brighter people leave the country-side and go to cities, was substantiated by Husen's study. Husen (1948) (cited in Sæson and Gladwin: 1958:123) analysed the results of large scale administration of Swedish Army Group
Intelligence test and found that migration from lower to higher population density areas was significantly more frequent among those with high test scores, and further added that the rural-urban differences in intelligence was due to selective migration.

A similar rationale was expressed by Fairbank (1973), and Gist and Clark (1938). In Gist and Clark study, high school students in a number of rural communities in Kansas (USA) were given the Terman intelligence test in 1922-23. In 1935, information was obtained on 2,544 of these individuals to determine whether or not they had migrated. Over 70 per cent of them had left their home towns, 38 per cent having moved to urban communities. Table 3.3 shows how the moving was related to IQ. It should be read down the columns rather than across the rows.

<table>
<thead>
<tr>
<th>IQ</th>
<th>Percent of group moving to cities</th>
<th>Percent of group remaining in country</th>
</tr>
</thead>
<tbody>
<tr>
<td>105 and over</td>
<td>26.97</td>
<td>17.46</td>
</tr>
<tr>
<td>95 - 104</td>
<td>33.82</td>
<td>29.87</td>
</tr>
<tr>
<td>Under 95</td>
<td>39.21</td>
<td>52.66</td>
</tr>
</tbody>
</table>
Of the groups that moved to city, about 27% had high IQs and about 39% had low IQs. Of the group that remained in the country the corresponding percentages were 17 and 53. For persons in the average group the difference was small. Statistical tests showed all these differences to be highly significant. The authors noted also a tendency for the migrants to large cities to be significantly superior to the migrants to small cities and the non-farm rural residents to be superior to the farm group.

In 1931, Klineberg (cited in Tyler; 1969: 354) in a European study found the rural children consistently inferior to city children. The tests used in his study were entirely non-verbal, and they were highly timed.

L.E. Tyler (1969) has reviewed a number of studies, and in her concluding remarks, she has expressed that no one type of explanation seems to account for all facts of rural urban differences in intelligence. Nevertheless, she has given three possible reasons for the difference that exists between rural-urban population in intelligence. According to Tyler the following are
the reasons for the difference:-

i) Many tests probably penalise rural children to some extent,

ii) There are marked educational deficiencies in rural regions,

iii) There is selective migrations from rural to urban areas.

And finally she concludes that country children, almost every where they have been tested, obtained lower averages on intelligence tests than do city children.

In another study, Lee (1951), having two questions in view: (i) Are the migrant Negroes who had migrated from South to North more intelligent than those who remained in the South? (ii) Was this because of selective migration or can the superior showing of the Northern Negro be laid to a more stimulating environment?, administered Philadelphia Test of Mental and Verbal ability. The Philadelphia - born students were divided into two groups, those who had attended kindergarten and those who had not. Migrants were divided into five classes, according to the grade in which they entered the Philadelphia School system, and roughly at two year intervals. It was found in the study that
Klineberg's hypothesis that "there is an increase in the intelligence score of Southern Negro migrants to New York with increasing length of residence in New York" was, in the main, substantiated by independent evidence in Philadelphia. It was also found in the study, that there was a significant and upward trend in the intelligence test rating of Southern-born Negro children as their length of residence in Philadelphia increased. This increase manifested itself not only on a general intelligence test but also on each of the sub-tests of the Chicago Test of Primary Mental Abilities with single exception of memory. He further added that the migrant children, who entered the first grade in Philadelphia were on the first three tests were definitely inferior to the Philadelphia born on the Philadelphia series of tests, but by the time they have reached sixth grade there was no significant differences in their test ratings and those of the Philadelphia-born group, who, like them, had not attended Kindergarten.

Urban-rural differences in test scores have like-wise been reported in a study by Lynn (1979). Lynn, using the data from different sources, studied the
social ecology of intelligence in the British Isles. The main sources used in the study were: (i) Vernon's (1947, 1951) studies in which Progressive Matrices were used as measures of intelligence, (ii) Douglas (1977) study, (iii) Davie et al (1972) study, and (iv) some important studies conducted in Ireland. The tools used in those studies were either performance tests or culture fair tests. In Lynn study, the mean population IQ of various socio-economic groups of sub populations (regions) of Great Britain were taken and comparison was made between them. It was found in the study that the mean population IQ of different regions of Great Britain differed significantly. The causes of differences in mean population IQ in different regions of British Isles accounted as due to

(i) historical differences

and (ii) selective migration of more intelligent individuals out of some regions and into others.

Most recently, K.G. Desai (1981) undertook a study in Gujarat (India) to check the claims of culture Fair tests that they work better in different cultures than the verbal or traditional non-verbal tests of intelligence. To check this claim, the performance of 320 school pupils (males and females) of different cultures of Gujarat State
on Raven's and Cattell's culture fair tests were compared with those on verbal and non-verbal tests of intelligence standardised on Gujarati population. The results of the study revealed the fact that cultural differences are marked among the urban, semi-urban and tribal groups; and sex differences are not significant in some groups and significant in others, depending upon to what extent girls are exposed to the same environment as boys. It was found in the study that the local tests of intelligence showed in no way lower discrimination among the various cultural groups than the culture Fair Tests of Raven and Cattell. He further added that these differences are due to (1) unfamiliarity of rural and tribal children with the manipulation of abstract figures of Raven and Cattell which have no clear meaning to them.

Several attempts have been made to study the children of isolated groups of mountain areas in America. These groups have been of special interest because of their relative isolation from outside social contacts. Because of poor roads and general inaccessibility, the inhabitants of these mountainous regions live in virtually isolation during a large part of the year. The groups
were also characterised by low standard of living and high degree of inbreeding. Intelligence test survey of children living in such isolated mountain communities have been conducted in Kentucky, Tennessee, Georgia and the Blue Ridge Mountains. And most of the results were quite consistent.

Anastasi (1958: 522) has made an attempt to review some of the studies which have been tried on these isolated groups. Her review reveals the fact that the mean IQ, of these isolated group children were clearly below the national (USA) norms; inferiority was greater on verbal tests than on non-verbal and performance tests; and there was a declining tendency with age.

Typical findings from a study conducted by Sherman and Key (1932) is worth noting. They selected 102 subjects from four hollows in the Blue Ridge Mountains, approximately one hundred miles from Washington, D.C; and 81 subjects from a small village school situated at the base of the Blue Ridge. It was observed that, racially, the inhabitants of the five communities were quite homogeneous, all having descended from a common ancestral stock. It was found, in the study, that both
village and mountain children averaged below 100 IQ on all IQ tests. The IQ tests used in the study were Pintner Cunningham test, National Intelligence Test, Goodenough Draw-a-man tests, and Pintner Patterson performance test. The investigators reported that the inferiority was less, however, among village children, who had better schooling facilities. Both groups showed a consistent age decrement, which was also less marked in the village group. In case of the mountain children, mean IQs were lower on verbal than on non-verbal and performance tests. The age decrement was accounted for deficient educational facilities.

In another study Smith (1942) administered three special tests, one of them non-verbal and the other two intended to test comprehension of written and spoken English, to children of respective ethnic groups, aged 10 to 15, in Honolulu in 1924, and then re-administered the same test to comparable groups 1½ years later in 1938. The investigator found that although the rank order of various ethnic groups had not changed over the years, mean scores of each group on the tests had risen substantially and significant differences were also found in measured
intelligence (both on verbal as well as on non-verbal tests) among various ethnic groups. The findings of the study revealed that 10 year old 1938 group had made two and a half year's progress in what might be called "mental age" in non-verbal tests. The significant rises in intelligence test scores over a 1½ year interval were accounted for considerable progress which had been made during this period in educational facilities. He further added that the less capable races would presumably take less advantage of improved opportunity than would the more capable races; the large score differences between 1924 and 1938 indicate that so called mental tests are measures of opportunity and not of mental capacity unless opportunity is kept constant or correction is made in it.

In a similar study conducted by Wheeler (1942), group intelligence tests were administered in 1940 to over 3000 children who were the students of 40 schools of East Tennessee mountain area. The results were compared with those obtained on children in the same areas and largely from the same family, who had been similarly tested in 1930. During the intervening ten-year-period the economic, social and educational status
of these sections had improved considerably. Paralleling such environmental improvements, a rise in IQ from the first to the second sampling was noted at all ages and all grades, the median IQs being 82 and 93 in the 1930 and 1940 sampling respectively.

A similar attempt was made by Asher (1935) on Kentucky Mountain children. He undertook a survey in order to get some idea of the relationship between the intelligence status of rural school children in different parts of the country and their SES. In Asher's study, the Myers Mental Measure was given to 363 rural school children in one mountain country in Southern Kentucky. In addition to Myers Mental Measure, the National Intelligence test, Scale B, was also given to 234 children of this group. It was found in the study that the median IQ on Myers test for each chronological age group decreased gradually and continuously from 83.5 at age 7 to 60.6 at age 15. When the results of this study, compared with the IQ norms was published with these tests where IQ 100 was considered indicative of average intelligence, it was found that the vast majority of the mountain children were below average intelligence. Only about 5 per cent of these children had IQs above 100 on the Myers tests.
A survey of SES of farm families made by the Bureau of Agriculture, indicated definite limitations in the social and material environment of the farm families in the mountain country in comparison with farm families in other parts of the country. The investigator concluded that these limitations were probably greater in comparison with urban and near-urban families, and the effect of these environmental differences on the measured intelligence of these mountain children is indicated in the decreases in median IQ with chronological age. He further added that the difference in the social and material environment of Kentucky mountain children and children in urban communities are such that the intelligence tests standardised on urban children are not adequate for measuring the kind and amount of intelligence of Kentucky mountain children. He has also suggested the different tests and methods for measuring IQs of rural and urban children.

SECTION II
SOCI¬ECONOMIC STATUS AND INTELLIGENCE

From the early days of intelligence testing movement to the present, one investigator after another has
reported consistent differences between the average IQs of groups at different socio-economic levels. There has been efforts to predict the IQ of the child if we know the social level of the parents. Researches have been conducted to discover whether IQ changes with transition from a poor to a good social environment, and to study the effects of such variables as age, length of residence, initial IQ, height or level of new environment and so on. In most of the studies the subjects were divided into different socio-economic groups. In some studies, the effect of social class, occupation of the parents, income of parents, home-environment, etc., of the subjects on their performance scores on intelligence tests have been studied separately. Some important studies in the area are given below in some detail.

In one of the studies, namely, Mid-West Project, Havighurst and Janke (1944, 1945) administered a battery of tests to ten year-olds of different socio-economic groups. The battery included Stanford-Binet, Cornell Coxe (a non-verbal test of intelligence), the Iowa Silent Reading, the Minnesota Paper Form Board (measuring judgment of spatial relationships), an adaptation of the
Minnesota Mechanical Assembly Test for boys and new Mechanical Assembly test of their own devising for girls, the Porteus Mazes, and the Goodenough Draw-a-Man Test. For sixteen-year-olds (1945) the battery included the Stanford-Binet, the performance-test from the Wechsler-Bellevue Scale, the Iowa Silent Reading, the Minnesota Paper Form Board, and the two Assembly Tests. Their aim was to include both verbal and non-verbal tests of intelligence along with tests more specialised in reading and mechanical aptitudes. It was found in their study that there were no children from the upper or upper middle classes in the ten-year-old group. For the sixteen-year-old group, these two classes were combined to give nine cases together. Table 3.4 and 3.5 show the means on the tests for the various status groups.

It was found in the study that the class differences were more marked on non-verbal (contrary to expectation) than on verbal tests, there was also a consistent tendency for urban children to do better than rural on intelligence and reading tests.
TABLE 3.4 Means of Social Status Groups on Psychological Tests - Ten-year-old Children (Havighurst and Janke, 1944)

<table>
<thead>
<tr>
<th>Social Status</th>
<th>Stanford Binet (IQ)</th>
<th>Cornell Coxe (IQ)</th>
<th>Goodenough (IQ)</th>
<th>Iowa Silent Reading Board (Score)</th>
<th>Paper &amp; Coxe (Score)</th>
<th>Mechanical Assembly (T.Scores)</th>
<th>Boys</th>
<th>Girls</th>
<th>MA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>26</td>
<td>114</td>
<td>116</td>
<td>107</td>
<td>99</td>
<td>22.5</td>
<td>11.6</td>
<td>16.0</td>
<td>12.7</td>
</tr>
<tr>
<td>D</td>
<td>68</td>
<td>110</td>
<td>110</td>
<td>102</td>
<td>99</td>
<td>21.3</td>
<td>49.2</td>
<td>49.5</td>
<td>12.8</td>
</tr>
<tr>
<td>E</td>
<td>16</td>
<td>91</td>
<td>96</td>
<td>91</td>
<td>88</td>
<td>15.7</td>
<td>46.9</td>
<td>41.3</td>
<td>10.4</td>
</tr>
</tbody>
</table>

TABLE 3.5 Means of Social Status Groups on Psychological Tests - 16 years old, (Janke and Havighurst 1945)

<table>
<thead>
<tr>
<th>Social Status</th>
<th>Stanford Binet (IQ)</th>
<th>Wechsler Bellevue (IQ)</th>
<th>Iowa Silent Reading Board (Score)</th>
<th>Paper &amp; Coxe (Score)</th>
<th>Mechanical Assembly (T.Scores)</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>A &amp; B</td>
<td>9</td>
<td>128</td>
<td>118</td>
<td>58.0</td>
<td>44</td>
<td>46.8</td>
<td>62.1</td>
</tr>
<tr>
<td>C</td>
<td>44</td>
<td>112</td>
<td>109</td>
<td>51.0</td>
<td>40</td>
<td>51.6</td>
<td>52.0</td>
</tr>
<tr>
<td>D</td>
<td>49</td>
<td>104</td>
<td>102</td>
<td>48.9</td>
<td>31</td>
<td>48.8</td>
<td>48.5</td>
</tr>
<tr>
<td>E</td>
<td>13</td>
<td>98</td>
<td>103</td>
<td>45.9</td>
<td>31</td>
<td>53.0</td>
<td>45.9</td>
</tr>
</tbody>
</table>

Simon and Levitt (1950) published some figures showing some sort of hierarchy for the Wechsler Bellevue Test running from professional men at the top to day-labour at the bottom. Foulds and Raven (1948) demonstrated
the same differentiations between occupational levels in Scotland. D.M. Johnson (1948), using Cattell's test as one of the measures of intelligence found that there were significant differences in intelligence among various occupational groups (cited in Tyler; 1969: 341).

Foulds (1949) demonstrated similar rationale in his study. Foulds administered two psychological tests, namely Progressive Matrices (1938), and Mill Hill Vocabulary Scale to over 5000 unskilled and skilled men, administrative workers, technical and university students. Table 3.6 shows each of the five occupational grades in one organisation, and the percentage frequency with which the scores fall into each quartile.
TABLE : 3.6 Percentage of Men into Five Chief Occupational Grades whose Test Scores Fall in the various Quartiles (Foulds, 1949)

<table>
<thead>
<tr>
<th>Occupational Grades</th>
<th>Matrices Test</th>
<th>Vocabulary Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Quartile Classes)</td>
<td>(Quartile Classes)</td>
</tr>
<tr>
<td>1) Directive and Executive Workmen</td>
<td>79 9 12 -</td>
<td>79 15 6 -</td>
</tr>
<tr>
<td>2) High Skilled</td>
<td>48 23 19 10</td>
<td>42 27 22 9</td>
</tr>
<tr>
<td>3) Skilled</td>
<td>29 25 27 19</td>
<td>28 24 31 17</td>
</tr>
<tr>
<td>4) Qualified</td>
<td>18 26 28 28</td>
<td>16 25 25 34</td>
</tr>
<tr>
<td>5) Unskilled</td>
<td>12 15 28 45</td>
<td>11 23 19 47</td>
</tr>
</tbody>
</table>

It is evident from the table that in both tests, almost four-fifth of men holding directive or executive positions fall into the first quartile and none at all into the fourth, and nearly half the unskilled workmen fall into the lowest quartile. According to both tests, 10 percent of the unskilled men obtained test scores equivalent to those holding directive or executive posts. The majority of these men were found to be men with short terms of services in their twenties.

Similar findings were found by Eells et al (1951),
administering a number of standard intelligence tests on all the nine-year-olds and all the thirteen and fourteen-year-olds in a small Mid-Western City, subjects whose social position had been identified by means of the Index of Status' Characteristics. The results showed that the verbal items seemed to show more status difference than did non-verbal items in intelligence.

Angelino and Shedd (1955) undertook a study to evaluate the culture fairness of the Devis-Eells Games by administering the test to two groups of children in Oklahoma City, 152 of lower class and 155 of upper class, utilizing the class criteria employed by Chicago Group. Approximately equal numbers were taken from each of the first six grades of two elementary schools. With the exception of the second grade, the difference in mean scores exceeded 15 points, and all the differences were significant at one per cent level.

A similar comparison of children divided into upper and lower class groups was made by Altus (1956) in the elementary school of Santa Barbara Country, California. She also found the Davis-Eells IPSA favoured the upper class children, who averaged 106.4 as against the lower
class mean of 97.9.

Some attempts have been made to evaluate culture fairness of CCFT. Certain studies provide more detailed analysis of socio-economic group differences in measured intelligence (CCFT scores). In a study Marquart and Bailey (1955) made an attempt to check the validity of CCFT scale 1 and 2 by relating differences in scores on Stanford Binet and Culture-fair test to the socio-economic status of the child. Seventyone children and adolescents ranging in age from 4 - 0 to 15 - 0 were employed in the study. All the subjects were either residents of the cities of Tucson or Phoenix, Arizona, or were attending private school in the Tucson area. There were 5 to 7 subjects per age group. They represented samples from the three broad economic classes; low, middle, and high. There were 21 subjects from the low, 35 from the middle and 15 from the upper economic class. It was found in the study that the results on scale 1 of CCFT seem to be influenced by culture as much as results on Stanford-Binet. Results on scale 2, however, corresponded to expectation. Even though some of the differences were not significant, they were in the expected direction. The
investigators, denying the possibility of preparing a test
culture-free, report that the results obtained from
scale 2 seemed to be less influenced by culture than were
results obtained by using the Stanford-Binet.

Similar attempt was made by Kidd (1962) to
investigate the culture-fair characteristics of the test
CCFT. He selected his subjects aged 10 -0 and 11 - 0
from the public, private and parochial schools in Tucson,
Arizona. These included 25 upper SES Anglos (13 male
and 12 female), 25 upper SES Mexican-Americans (12 male and
13 female), 25 lower SES Anglos (12 male and 13 female)
and 25 lower SES Mexican-Americans (13 male and 12
female). It was found from the analysis of the data
that the differences in measured IQs between the socio-
economic groups were significant at five per cent level.
The detailed analysis and findings of the study are
presented in Section IV in the present Chapter (See
Table 3.7 and 3.8).

Canady (1936) administered several tests to all
Freshmen at West Virginia State College. The subjects were
categorised under different occupational groups. His
study revealed the general picture in assigning higher
average intelligence scores to the professional and commercial groups and in showing the skilled and unskilled labour group fall all at or near the bottom of the scale. But he did not deny the possibility that the poor boy may "make good" and that the rich boy despite the most favourable environment may fail miserably.

Neff (1938), with a purpose to examine the precise character of the relationship between socio-economic status and intelligence, examined some of the research papers which have been published in the area of intelligence and SES. After thorough examination of six studies, he concluded that the IQ may be depressed by continued residence in environments offering poor cultural and educational opportunities. Summing up all the six studies, he concluded that twenty to thirty points of IQ may be lost, on the average, by continuing exposure to a low environment; and individual loss may be as great as 50 to 60 points in IQs from year 1 to 14 in some cases.

The possible effects of SES of IQ test scores was also considered by Ester (1953). In his study, Ester administered the WISC to two groups of II and V grade children differing in SES as measured by the Warner -
Muhr-Eells Index of Status characteristics. Significant differences in favour of the higher level were found in the total group of children and for the second grade children. The difference for the 5th grade children was not significant. In a follow up study, Estes (1955) re-tested 18 Ss of the upper and 14 Ss of the lower socio-economic group after a period of two years. The significant difference found when the children had been in second grade no longer existed. He attributed this lessening of the effect of SES to the increased "Levelling" influence of the school with the passage of two years.

By administering WISC, Laird (1957) tested two groups of 11 - year - old children differing in SES but matched for a number of other variables. The mean score of the upper socio-economic group fell within the bright normal range while the lower group had a mean score falling within the average range. Greater differences were found between verbal and Full Scale scores than between performance scores.

In another study Littell (1960) reviewed a research literature of a decade concerning the WISC, and concluded that the SES appears to be a significant
variable affecting the IQ scores of young children, such that the children of higher SES tend to obtain higher scores on WISC.

C.L. Anand's (1973) study was designed to investigate the effect of socio-economic environment and medium of instruction on mental abilities and academic achievement. One of the objectives of the study was to probe into the relationship between socio-economic environment and non-verbal intelligence. The sample consisted of 1897 pupils of standard VIII, IX and X (956 Kannada medium and 941 English medium subjects) chosen randomly from eighteen urban High Schools. The tools administered, in the study were:

i) Kuppuswamy Socio-economic status scale (Urban),

ii) Nafde's non-verbal test of intelligence (NVTI),

iii) Group test of scholastic abilities - the battery of achievement tests in general mathematics, general science and social studies for 8th, 9th and 10th standards and

iv) information inventory prepared by the investigator.
The data were analysed with the help of Chi-square test and analysis of variance. The analysis of the data revealed the following:

i) the 'F' values of scores on all that criteria tests were found significant and

ii) three SES groups differed significantly from one another in their non-verbal intelligence, high SES groups achieved higher mean scores than pupils in both middle and low SES group, whereas the mean score difference between middle and low SES groups was not significant.

Impact of socio-economic environment was found to influence mental abilities and academic achievement. Pupils reading in different media of instruction differed significantly from each other in their verbal and non-verbal intelligence.

Hall, et al (1973) administered Raven's coloured Progressive Matrices as measures of reasoning on 16 subjects from each of four sub-cultures (urban lower-class white, urban lower class black, rural lower class white and suburban middle class white) from 1st to 4th grades. The scores were analysed using two one-way analysis at both the First (F = 4.3, df = 3/60, P < 0.00) and Fourth
(F = 11.7, df = 3/60, P < 0.01) grade levels. By using Scheffé's analysis, he found that in both cases the three lower class means were significantly lower than the middle class mean (P < 0.05) but did not differ significantly from each other.

In a study Bradley, Caldwell and Elardo (1977) made an attempt to investigate the effect of environmental process measures on IQ test performance. They made comparison between an environmental process measures and SES measures in terms of their relation with Stanford-Binet IQ at 3 years of age. Separate analysis was made for Blacks and Whites, and males and females. Results of their study indicated that the environmental process measures predict IQ as well as combination of process and status measures. It was also found in their study that the mean IQ of Blacks and Whites differed significantly.

Lynn (1979), in his study (find elsewhere in preceding section) considered the mean population IQs of 13 regions of Great Britain in relation to a number of social and economic phenomena. These phenomena consisted measures of intellectual achievement (Fellowship of Royal, Society, and first class honours degree), per
capita income, unemployment, infant mortality, crime and urbanisation. For all these variables there was reasonably strong evidence of a relationship with intelligence at the individual level, that is, individual intelligence was related positively to intellectual achievement, income and urbanization and negatively to infant mortality and crime. Lynn argues that his investigation is predictive, in the sense that known relationship of intelligence to various social and economic phenomena at the individual level will also be found at general level.

A study was conducted by Jachuck and Bhubaneswar (1981) to test some of the major hypotheses of Jensen's two level theory of mental abilities. Three groups of subjects from Class IV were selected on the basis of their Level I and Level II abilities and were examined with regard to six major home environmental variables. The results showed a functional dependence of Level II abilities on Level I abilities. But contrary to Jensen's genetic explanation the home-environmental variables were found to be more effective in explaining sub-group differences in cognitive functioning.
Jehan (1981) administered Seguin Form Board Test of Intelligence to 50 socio-culturally deprived (under privileged) and 50 non-deprived (privileged) children with age range of 5 - 10 years. The results of his study revealed that socio-culturally deprived children were significantly low in their intelligence level than the non-deprived children.

SECTION III
RACE OR CASTE DIFFERENCES
AND
INTELLIGENCE

A large number of studies have demonstrated that children, particularly of school age, of different ethnic, caste, racial and cultural groups perform differently on intelligence tests even when age, social class and the like are held constant. The views of different researchers who have made strenuous efforts in the field can be summed up under two heads, namely, pro-racists (supporters of genetic theory) and environmentalists. They opine that the ethnic, caste, racial or cultural differences in intelligence exist either due to their existing differences in genetic determinants or due to environmental
variations. Some important studies in the area are given below in some detail.

Goodenough (1926) administered Goodenough intelligence test (non-verbal) to 2457 public school children. All the subjects were American-born but categories were made on racial stocks. It was found in her study that children of different racial groups have been found to differ in their performance on Goodenough Test. Out of 2457 subjects, there were 613 Negro School children from the South (Tennessee and Louisiana) and 69 from California. She found that on this test to be 78.7 and 85.8 for Southern and Californian Negroes respectively. The differences within Negro group might have stemmed from their regional differences. Her study demonstrated racial differentials in intelligence among various racial groups.

Contrary to Goodenough's study, Anastasi and D'Angalo (1952) demonstrated their findings showing no significant race difference in Goodenough Draw-a-man IQ. The study was concerned with language development of Negro pre-school children. For comparative purpose, a non-language test, the Goodenough Draw-a-man test was employed. One hundred subjects were selected, all within six months
of their fifth birth day, attending Day Care Centres of New York City Department of Welfare. Age, sex ratio and bilingualism were controlled in the sampling. They found no significant race difference in Goodenough Draw-a-man IQ.

Similar results were found by Anastasi and Jesus (1953) when Goodenough Test was used on Puerto Rican pre-school children in New York City.

After administering the Pintner Paterson Performance Tests to a number of Indians and Negroes in United States, Klineberg (1928) concluded that these children scored lower than the White. Superiority of Indians in IQ scores over Negroes was also found in the study. The author further added that these differences were primarily because they could not meet the time criteria, but when given adequate time to complete the test they could reach normal level of accuracy, and the superiority of White over Indian and Negro children in performance test, if not entirely, a superiority in scores for time. This finding raises the question whether time-limit tests, of which many are appropriate for use with any sub-cultural groups, do not place premium on speed.
Reviewing the above study, Sarason and Gladwin (1958) raised the question, "that, if member of ethnic sub-groups are able to solve problems correctly and live in a setting which does not require that problem be solved with great rapidity, is it justified to review the test results which are lowered by a speed factor as indicator of inferiority, whether inherent or learned?"

Maintaining the similar rationale, ELineberg (1944) argued that the Negro was handicapped in taking Army Alpha Test by his lack of knowledge of English. Keeping this view in mind, data on both Alpha and Beta Tests were taken and compared, and still found the differences in both the test scores.

In another study, Klineberg (1931) administered a performance scale of intelligence to 700 rural European school boys classified with respect to nationality (French, German and Italian) and physical type (Nordic, Alpine and Mediterranean). Significant differences in mean scores were found to be associated with national grouping but not with physical type.

Nissen, Machover and Kinder (1935) administered
a series of twelve performance tests to 50 native West African Negro children living in the area which supplied many Negroes for the American slave trade. The performance as a whole was compared with American standardisation groups. It was observed in their study that both the Army performance scale and the entire series of tests, are unequivocal in showing a marked inferiority in the immediately present abilities of Negro subjects as compared to norms of the standardisation groups on the same test. In discussing the study and its findings, the author pointed out to the involvement of both racial and environmental influences in yielding differences in intelligence test performance and argued further that a given test performance need not necessarily have the same significance or same correlates for subjects with diverse ethno-cultural backgrounds; and concluded that these differences may stem from the impoverished environment of Negro children.

Tenser (1939) maintained that Negroes living in Kent country, Ontario, enjoyed "every political and social advantage" which Whites had, but that nevertheless, their Pintner - Paterson and National Intelligence Test scores were significantly lower than those of White. Later on
Klimeberg brought to light a comment by Anastasi that according to Tanser's own data, differences were significant in the socio-economic levels of the two groups and in the average school attendance.

Brown (1943) compared the performance of 341 White and 91 Negro Kindergarten children in Minneapolis on the Stanford-Binet, Form L discovering that the Negro mean of 100.78 was significantly lower than White mean of 107.06. The White children in occupational class VI and VII (Minnesota Scale) averaged about the same as Negro children.

Alper and Boring (1944) analysed the Army Alpha and Beta data of Whites and Negroes and concluded that the differences in intelligence among White and Negro subjects are due to race, geography and educational disadvantages of Negroes.

Garrett (1945) in a study, utilising the data from Army Alpha and Beta sources, found significant differences in intelligence both on Alpha and Beta Scales among Negro and White subjects. Garrett argued that given better education the Negro does, indeed, improve his Alpha or Beta score but not the position relative to
the White, and further argued that the difference as between the two races are not considerably reduced upon a non-language test.

Mc Gurk (1953a), after having his test questions sorted into "cultural" and "non-cultural" categories by 78 judges, administered these items on comparable groups of Negro and White subjects. He found that there was more difference between groups of White and Negro High school students on the "non-cultural" than on "cultural" items, contrary to environmentalist indication. In his study 213 Negro and 213 White youths were matched for age, school attendance, curriculum and for social and economic variables by means of "Sims Record Card". Mc Gurk found that even when SES variables were thus controlled the scores of White and Negroes differed significantly in the direction usually reported. He further added, that, as SES increased, the difference between Whites and Negroes increased rather than decreased, again contrary to the expectations from cultural theory of differences in intelligence. Mc Gurk (1953) re-examined the data with the purpose to get the satisfactory solution to the problem - how the SES of Negro subjects affects their differential
test performance on non-culturally weighted and culturally weighted test items. The study again yielded the test result showing the superiority of the Negroes of high SES over the Negroes of Low SES. This superiority was associated more with a superior performance on the non-cultural items than the cultural items.

In Higgins and Sivers (1958) study, 349 Negro and 440 White children were tested individually, first with the Stanford-Binet, Form L, followed by the coloured Raven's Progressive Matrices. The hypothesis to be tested, in the study, was that "for a population of low SES, there is no significant difference between the Stanford-Binet IQ and an IQ obtained from a non-verbal test of intelligence (CEPM). It was observed in the study that the white children had a mean CRPM IQ which was 10.29 points higher than the mean of Negro children, and this difference was statistically significant, but no significant difference on Stanford-Binet Scale was observed.

In another study Semler and Iscoe (1966), made an attempt to study the learning abilities of Negro and White children under four conditions. To make a comparative study, the performance levels on the WISC and the Progressive Matrices (PM) and the factorial structure of WISC were compared for Whites and Negroes. WISC was administered
individually to 141 Whites and 134 Negroes ranging from 5 through 9 years of age. The 7-, 8-, and 9- year old subjects were given the Progressive Matrices as a group test. It was found in their study that White subjects had higher WISC - FS IQ than Negroes at all age levels (P < 0.001) and higher PM total scores at the 7 year level (P < 0.05) but not at the 8- and 9- year levels.

In Leach (1963) study, 29 Negro and 29 White children matched for sex, chronological age, grade, years in school, economic status as determined by father's or parent's occupation, and junior high school enrollment were given the California Test of Mental Maturity. It was found in the study that on all tests of the CTMM White children scored higher than Negro children. Comparison on grades was also made, with White children generally receiving higher grades.

In a study, Wysocki and Wysocki (1969) administered Wechsler-Bellevue Intelligence Scale to 137 White and 110 Negro Veterans, of comparable age level, but differing significantly in education. It was found in their study that the Negro veterans scores lower on all sub-tests, but scored significantly higher than the Whites on the Digit-Span which required a good memory and attention.
One finding came out from their study that the Negroes, despite their lower educational levels, scored higher (contrary to expectations) on the verbal than on the performance part of the scale. Both the groups (Negroes and Whites) also showed large differences on performance than on verbal scales. The investigators warranted that the comparison of racial groups based solely on intelligence test scores should be treated with caution.

Payne's (1969) study was designed, first, to investigate the differences that may exist in the performance of two racial groups (West Indian and British) on certain commonly used standardised tests, and second to devise a classification test of concept formation that would be as free as possible of any direct cultural bias and upon which both racial groups would perform equally well when matched for levels of vocabulary definition. Ninety-nine West Indian immigrant children, 100 randomly selected British children, and 99 British children matched with West-Indian children selected according to verbal ability. All the three groups were matched for levels of SES. Coloured Progressive Matrices were used as measures of IQ along with other tests. Significant differences were found between the two racial groups on all the standard
test employed (P. 005), but no significant difference was found on the classification test of concept formation. The correlation coefficient calculated for the second British group in the case of Raven's Matrices/Burts word reading (0.50) was found to be significantly greater than that obtained by the West Indian group (0.24) \( P<0.05 \).

Thakral (1977) made a comparison between scheduled caste and non-scheduled caste group subjects on the scores obtained by them on Locus of control vocational aspiration and intelligence tests. CCFT - Scale 3 was used in his study, as a measure of IQ. The sample was drawn from Rajasthan (India). CCFT was administered to 484 SC and 556 non-SC subjects to obtain IQ scores. He found significant differences on the general intelligence dimension (CCFT scores) between these two groups. He further added that these differences may stem from their existing differences in their antecedents.

Dreger and Miller (1960) in an extensive review of psychological differences between Negro and White subjects, while not disagreeing completely with genetic explanation of Garrett and Shuey, have stressed strongly the importance of psycho-cultural factors and the need for further cross-cultural research. Maintaining the same
trend, after reviewing a decade of research in the area, Dreger and Miller (1968) concluded that the caste factors are still operating in yielding consistent significant differences in intelligence between Negro and White subjects. The review by Dreger and Miller suggests two possible reasons for these differences. They can be included under two main headings. First, there is some doubt as to whether tests designed for White subjects are altogether adequate measures of Negro intelligence. Second, some developmental influences other than educational and socio-economic handicaps may be having consistently depressing influence on the mental growth of Negro children.

Summarising the test performance of Negro and White subjects on various intelligence tests studied by different investigators, E.L. Tyler (1969: 317), while not disagreeing completely with the explanations on White and Negro difference in intelligence, has strongly stressed the importance of future research on developmental aspects of intelligence.