Some attempts have been made to study the effects of psycho-socio-cultural factors on intelligence. Certain studies provide detailed analysis of various group differences in measured intelligence. In this section, attempt is made to survey some of the studies which provide the evidence of interaction and correlations of various psycho-socio-cultural factors with intelligence in some detail.

Thorndike (1951) utilised the Pintner IQs and Metropolitan Achievement Scores of half a million children in 300 communities. Correlating average test scores for each community a variety of other measures, he found the following correlations with IQs to be significant (in decreasing order of significance):

i) educational level of adult population,

ii) proportion of persons owning their homes,

iii) quality and cost of housing,

iv) proportion of native born White persons,

v) rate of employment of women (a negative correlation) and
vi) the proportion of professional workers in the population.

Correlation with achievement scores were significant only for the populations of professional workers and the educational level of adult population. The tests were administered excluding the public schools and where schools were segregated, only in White schools.

By administering the California Test of Mental Maturity on Ceylonese population, Straus (1954) aimed at testing the hypothesis that sub-cultural differences in personality are of equal or greater importance than differences between major cultures. To test this hypothesis, subjects of different sub-cultures (ethnic groups), religion, and residence (SES) within Ceylonese population were studied to determine whether or not they conform to a specific pattern of mental ability: high verbal and low non-verbal tests performance. Sixteen sub-cultural groups within the university of Ceylon were examined. Incidentally, it was made known that all the groups showed a tendency to differ from each other in relation to sub-culture. The same tendency was found in language as well as non-language factors in intelligence. To be more specific, it was found in his study that different ethnic groups
showed significant difference in their mental ability scores on non-language factors. Rural-urban difference in mental ability was also found in the study. The average test performance of the students from rural areas were found to be lower than that from urban areas; but the more rural of the former group viz., those who are the children of planters and paddy farmers have lower scores than the children of families living in rural areas, but following non-agricultural occupations. The effect of SES was also reported in the study, stating that there is a moderate correlation between the scores of SES and of IQ on Mental Maturity Test.

Sperrozzo and Wilkins (1958) administered Raven's coloured Matrices to upper, middle and lower class White and Negro subjects. Using analysis of variance, they found significant main effects for age, race and SES and significant interaction effects for Race X SES, and for Race X Sex X Age X SES. Separating the social classes, Sperrozzo and Wilkins (1959) reanalysed their data and found significant effects for age, race, with subjects from professional and skilled occupational levels and for the age and sex for the unskilled level. These data, when, indicate that on the coloured Matrices tests, race
significantly influences scores of upper SES students, while the sex variable tends to be more important for lower class students.

In a similar study, Tulpin and Newbrough (1968) administered the Raven Standard Progressive Matrices to 356 fifth and sixth grade male and female students of different SES groups from White and Negro population. The general purpose of their study was to determine the effect of past experiences related to race, social class and sex. It was found in their study that the Matrices Test yielded different scores for groups when classified singly by social class and race. The higher social class and White subjects showed significantly higher scores. The author further added that these differences may possibly be due to urban-rural or other regional differences.

Kidd (1962) undertook a study to investigate the culture-fair aspects of the test of g. His study was designed to:

a) investigate the culture-fair characteristics of the test CCFT;

b) determine which items are more culture-fair; and
c) discover which aspects of intelligence actually are measured by the test.

Kidd selected his subjects on the basis of Warner's ISC (Index Status Characteristics) applied to their parents, four groups of children between the chronological ages of 10 - 0 and 11 - 0 were selected 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). The revised Stanford-Binet, Form L and the Test of g: Cattell Culture-Free were administered to the children. An analysis of variance was done on both the tests. The results are shown in Table 3.7 and 3.8.
Table 3.7 Analysis of variance of Binet IQs
(A.H. Kidd 1962)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>National group's: A</td>
<td>1</td>
<td>4998.49</td>
<td>4998.49</td>
<td>16.93**</td>
</tr>
<tr>
<td>Economic level: B</td>
<td>1</td>
<td>6905.61</td>
<td>6905.61</td>
<td>23.39**</td>
</tr>
<tr>
<td>Sex</td>
<td>C</td>
<td>7.25</td>
<td>7.25</td>
<td>0.03</td>
</tr>
<tr>
<td>Interactions: AB</td>
<td>1</td>
<td>193.21</td>
<td>193.21</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>2991.38</td>
<td>2991.38</td>
<td>7.76**</td>
</tr>
<tr>
<td></td>
<td>BC</td>
<td>178.37</td>
<td>178.37</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>ABC</td>
<td>606.08</td>
<td>606.08</td>
<td>2.05</td>
</tr>
<tr>
<td>Error Term</td>
<td>92</td>
<td>27165.40</td>
<td>295.28</td>
<td></td>
</tr>
<tr>
<td>TSS</td>
<td>99</td>
<td>42345.79</td>
<td>4274.40</td>
<td></td>
</tr>
</tbody>
</table>

** 0.01 Significant, *0.05 Significant

Table 3.8 Analysis of variance of Test of 'g' IQs
(A.H. Kidd: 1962)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MSS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>National groups: A</td>
<td>1</td>
<td>5610.01</td>
<td>5610.01</td>
<td>15.58**</td>
</tr>
<tr>
<td>Economics level: B</td>
<td>1</td>
<td>2016.01</td>
<td>2016.01</td>
<td>5.60*</td>
</tr>
<tr>
<td>Sex</td>
<td>C</td>
<td>.49</td>
<td>.49</td>
<td>0.001</td>
</tr>
<tr>
<td>Interactions: AB</td>
<td>1</td>
<td>1204.09</td>
<td>1204.09</td>
<td>3.34</td>
</tr>
<tr>
<td></td>
<td>AC</td>
<td>524.81</td>
<td>524.81</td>
<td>1.46</td>
</tr>
<tr>
<td></td>
<td>BC</td>
<td>3853.21</td>
<td>3853.21</td>
<td>10.70**</td>
</tr>
<tr>
<td></td>
<td>ABC</td>
<td>6042.25</td>
<td>6042.25</td>
<td>16.73***</td>
</tr>
<tr>
<td>Error Term</td>
<td>92</td>
<td>33124.52</td>
<td>360.05</td>
<td></td>
</tr>
<tr>
<td>TSS</td>
<td>99</td>
<td>53375.39</td>
<td>539.15</td>
<td></td>
</tr>
</tbody>
</table>

** 0.01 Significant, *0.05 Significant
The differences between national groups and economic levels were found significant at 0.01 level and 0.05 level respectively. There was no significant difference between the sexes, but the interaction between national groups and sexes was significant in case of Binet IQs, and interaction between economic level and sex, and between economic level, national groups and sex were found in case the test of g. After determining the factor-structure of the culture-fair items, Kidd concluded that CCFT reflects a mixture of ability, school achievement and social background and added further that the preparation of truly "culture-free" test appears to be an impossibility because even methods of manipulation of material objects are culturally determined.

Semler and Iscoe (1963) studied 135 Negro subjects with 141 White subjects across age levels 5 through 9 years under four experimental studies. Each child was administered WISC using trained examiners. Table 3.9 provides comparative WISC Full Scale IQ data for 275 subjects by sex and age levels. The superiority of White, especially at the lowest age level, was found in the study.
Table 3.9 Mean WISC-FS IQs of White and Negro children by Sex at Five age levels (Semler and Iscoe 1963)

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Ages in years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>White Boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>108.3</td>
<td>104.2</td>
</tr>
<tr>
<td>N</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>White Girls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>116.5</td>
<td>104.9</td>
</tr>
<tr>
<td>N</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Negro Boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>83.4</td>
<td>92.6</td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Negro Girls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>82.5</td>
<td>103.00</td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>12</td>
</tr>
</tbody>
</table>

It was found in the study that a highly significant difference in WISC-FS IQ in favour of White subjects and significant difference across the age levels studies. They further added that these differences may also be due to (i) the socio-economic differences that exist between two groups, especially at the age five and (ii) the impoverished environment of Negro children which does not stimulate them toward new learning situations.

In Jensen's (1974) study, the two levels (level I and Level II) of mental abilities were hypothesised to
interact with socio-economic status and race. One of the hypotheses set for the study was that the social classes do not differ, on the average, in level I ability, but differ on level II ability. Jensen claims that level II ability is best measured by test of general intelligence loading tests and especially those of the non-verbal, fluid intelligence, culture fair variety. By administering Lorge-Throndike Intelligence Tests (verbal and non-verbal), Jensen tested two groups, namely, the Black children (n = 1,123) and the White children (n = 1,489) enrolled in regular classes of South, 5th and 6th grades from all 14 elementary schools of the Berkely unified school district of California. The results of the study demonstrated the superiority of Whites over Blacks in level II ability. White-Black (race) differences in level II ability were greater than the SES differences within the racial groups. It was also found in his previous findings that the White and Black groups, and to a slightly lesser degree the high and low SES groups within each race, differed much more, on the average, in level II than level I ability. He further suggested, to have an SES rating on a continuous scale based on a large number of home background factors, which might reflect more closely the nature of the child's environment than does merely the occupational classifications of his parents.
Samuel, et al (1976) administered the performance sub-scales of Wechsler Intelligence Scale for children (WISC) to 208 male and 208 female Negro and White subjects between 12 and 16 years of age. The results, of their study provide the evidence of the effect of SES and race differences in causing differences in mean IQ scores, and also that inter-racial differences in mean IQ might be crossed depending upon the social, psychological characteristics of the test setting and the socio-economic background of the testee.

In a study Strauch (1977) aimed at investigating, sex X race interaction on cognitive measures. To study sex X race interaction, the WISC - R (1974) was administered in the early 1970's to 2200 children, ages 6 to 16. The subjects were carefully matched on such factors as sex, race (Black and White), occupation of father, region of country and type of Locale (Urban - Rural). It was found in his study that there was no significant difference in IQ among males and females, Race, SES differences were found statistically significant, but no sex X race (Sex x SES, race X SES) interaction was found in his study.

Hall and Kaye (1977) studies the pattern of early cognitive development among boys in four sub-culture
The major question was to know how White and Black subjects developing in different sub-cultures differ in patterns of cognitive ability. To ascertain the fact, 600 boys of age 6, 7 and 8 years belonging to middle and low social class were given tests of memory, intelligence, learning and transfer tests. Raven's coloured Progressive Matrices and Peabody Picture Vocabulary Test were used as measures of intelligence. It was found in their study that there were significant age advances for all groups on all measures. There were social class differences on Learning and intelligence tests. There were also racial differences on intelligence, digit span and paired association learning. There were significant age (F = 85.49, P<0.001), race (F = 53.66, P<0.001), Class (F = 41.95, P<0.001) main effects. In addition to above there were significant age X race X Social class (F = 3.05, P<0.05), and race X Social class (F = 5.4, P<0.02), interactions. From the examination of the data of the study, it was found that White children do better than Black children, and middle class children do better than lower class children on progressive matrices. Investigators reasoned out possibilities for the discrepancies among two racial groups as due to home or school environment of Black children which do not foster abilities represented in the PPVT and RCPM.

Keeping the hypothesis in view that whether SES
indicators sufficiently represent those aspects of environment relevant to IQ, Trotman (1977) compared the intellectual environment rating scores to 50 Black and 50 White middle class families of IX grade girls with that of Otis-Lennon Mental Ability Test scores, Metropolitan achievement test scores, and grade point averages of the same subjects. It was found in his study that (a) among middle class families with similar SES ratings there was significant difference in intellectual home environments of Blacks and Whites; (b) there was a direct relationships between the intellectual home environment and child's IQ; and (c) among middle class Black families, the degree which the family exhibited on intellectual home environment was at least as good as predictors of child's academic achievement as was the child's intelligence test score. He further added that between Blacks and Whites there is a cultural difference in the home experience and parent-child interactions, even with the same economic stratum, that may help to explain the different intelligence test performance by the members of the two cultures.
CHAPTER IV

THE PRESENT STUDY

The Statement of the problem
Variables - Definition of
Terms - Hypothesis - Delimita-
tion of the Study
CHAPTER 17

THE PRESENT STUDY

The present Chapter deals with the following aspects of the study.

1. The statement of the problem.
2. Variables
3. Definition of terms,
4. Hypotheses and
5. Delimitation of the study

1. The Statement of the Problem

As explained in earlier chapters, the present study is a scientific attempt to study the effect of sub-culture, socio-economic, and caste variables on the performance of IX and X grade pupils of Karnataka on Cattell Culture Fair Test of Intelligence. Studying the effect of these variables on CCFT Scores leads to identify the predictors of general intelligence of Karnataka population. This is of course, most important for programming developmental activities to help needy pupils and thereby attaining the goal already stated in earlier chapters.
The study has been designed with 'general intelligence' (CGFT scores) as the dependent variable and other three variables as independent variables or predictor variables. The predictor (independent) variables used in the study are:

1. Sub-culture (Urban/Semi-Urban/Rural)
2. Socio-economic status (Upper/Upper-Middle/Middle/Lower-Middle/Lower)
3. Caste (Forward Caste/Backward Caste/Scheduled Caste and Schedule Tribes).

2. Criteria used in the Selection of the Independent Variable

The major focus of the study as explained in earlier sections of the report, was on the identification of variables which can be used for predicting general intelligence of IX and X grade pupils of Karnataka. This essentially meant that 'general intelligence' of subjects will be treated as the dependent variables, while predictors will be treated as the independent variables. This led to the first important question to be answered by the investigator: the criteria to be used for selecting the independent variables.

Of last, one of the objectives of this study was
to test the culture fairness of the CCFT. CCFT scores must be free from educational and cultural pressures and highly loaded with 'g' as it is claimed by its author. It has been widely used by test users as index of 'general intelligence'. By thorough analysis of related literature, it is made to know that the author has not used Indian population while designing the test. Using CCFT, K.G. Desai tried with Gujarat sample and found the failure of culture-fairness of CCFT. This led the present investigator to the selection of sub-culture, SES and Caste variables as independent variables to test the culture fairness of the test on Karnataka population and to confirm whether the test is really culture fair for Indian Society.

The investigator decided to work out a series of scientific criteria for selecting the predictor variables. Theoretical and practical considerations led to the formulation of the criteria presented below:

(1) **Prediction Potential**: This refers to the ability of a selected variable to predict the criterion (general intelligence) as indicated by correlation of the variable with general intelligence reported in earlier research studies.
(ii) Socio-cultural Variety: This referred to the possibility of the different selected variables to represent a wide variety of social and cultural functions, each of which can add some new information to the cumulative measure used for predicting the criterion (general intelligence).

(iii) Independence from Schooling: This refers to the fact that the selected variables, measure traits of abilities not directly developed through schooling, but relatively independent schooling and instructional activities.

(iv) Practicability: This refers to the possibility of a selected variable lending itself to objective and group measurement, in other words, a test for measuring the variable be capable of group administration and can be administered with ease and economy by teachers, (potential users) who do not have much specialisation in testing.

The criteria helped in fixing the independent variables. Accordingly three independent variables viz., sub-culture, socio-economic status and caste were selected and used in the present study.
3. Definition of Terms

In developing the study, a number of important educational sociological and psychological terms have been used. For the sake of clarity, it was decided to define the important terms:

Independent (Predictor) Variable: The term stands for any behavioural measures of accepted validity and reliability, which by virtue of its associations with another (dependent) variable or construct (often termed a criterion) can be used for predicting the criterion or to ascertain its relationship with the dependent variable under observation.

Dependent (Criterion) Variable: This term stands for any criterion variable which is dependent on the independent variable. This has a tendency to vary as the independent variable varies.

In the present study, sub-culture, socio-economic status and caste of the subjects have been used as independent variables and general intelligence (CCFT Score) of the subjects as the dependent variable.
Sub-Culture: This term refers to the geographical regions in Karnataka and it is further divided into Urban, Semi-urban and Rural areas.

i) Urban: This term stands for any City in Karnataka wherein the Municipal Corporations are functioning and which are highly industrialised or commercialised.

ii) Semi-Urban: This term stands for district head-quarters wherein municipalities are functioning (This does not include corporation areas) and which have some industries.

iii) Rural: This term stands for a taluka place or village area in Karnataka, which is agrarian mainly.

Socio-economic Status: This term refers to the position of the subject on the scale of accepted, validity and reliability. In this study, SES stands for the score obtained by a subject on "A common Socio-economic Status Scale for Urban and Rural areas" used in the study. The scale is further divided into five levels and these levels are upper, upper-middle, middle, lower-middle and lower.
This classification was based on the SD of the T Score distributions of each sub-culture group. (See Appendix B).

**Caste:** This term refers to the caste system prevailing in Karnataka. It was further classified into Forward Caste (FC), Backward Caste (BC) and Scheduled Caste and Scheduled Tribes (SC and ST). This classification was done in accordance with Part IV Section I-B Central Act and Ordinance dated 27th July 1977, and Havanoor Commission Report of Karnataka (See Appendix C).

**General Intelligence:** This term refers to the standard performance of subjects of various groups under consideration of CCFT. The performance levels of subject are expressed in terms of scores obtained on CCFT.

**Subjects:** This term refers to students attending the grades, IX and X, in High Schools in Karnataka.

**CCFT:** This term is the abbreviation of Cattell Culture Fair Test of Intelligence.

4. **Hypotheses**

The survey of studies and personal experience led to the choice of the independent variables and to the framing
of the major hypotheses for the study. The hypotheses framed for the present study are given below:

(i) The subjects of Urban, Semi-urban and rural areas do not differ significantly on general intelligence dimension.

(ii) The subjects of different SES levels do not differ significantly on general intelligence dimension.

(iii) The subjects of different Caste groups do not differ significantly on general intelligence dimension.

(iv) There exists no significant interaction between SES and sub-culture groups.

(v) There exists no significant interaction between sub-culture and caste groups.

(vi) There exists no significant interaction between SES and caste groups.

(vii) There exists no significant interaction (three factor interaction) among sub-culture, SES and caste groups.

(viii) There exists no significant difference in the performance of various groups of subjects on CCFT.
5. Delimitation of the Study

The study is limited to students attending IX and X grades in High Schools of Karnataka. The classification of Caste Categories is done in accordance with the Central Government and State Government reports. To question the validity of this classification is beyond the scope of this study. Similarly, classification of sub-culture categories is done in accordance with the information available regarding population and nature of municipal administration of a particular sampling area.

While owning the above limitations, the investigator would like to point out that these limitations are not of such a serious nature as to vitiate the findings. Most of them are the limitations about which the investigator could do little in the available time and facility and within the scope set for the study.