CHAPTER IV

METHOD AND PROCEDURE
Sample

The total sample was composed of 200 Primary School Children of both the sex generated by two age levels, 6 to 8 years and 9 to 11 years divided into 8 sub-groups on the basis of their maternal employment status, Socio-economic Status (SES) and age.

The present study was based on a 3 Factor (2X2X2) Factorial Group Design. The first factor (A), maternal employment had two levels: Employed and unemployed. The second factor (B), Socio-economic Status (SES), also had two levels: High SES and low SES. The third factor (C), Age also had two levels: Younger (6-8 years) and Older (9-11 years). Thus, the Design (2X2X2) yielded 8 Cells, each Cell representing a subgroup of the total sample. There were 25 children in each subgroup; 200 children (both boys and girls in unequal numbers) in total. The Study Design is schematically presented in the following table.
Table 1  
Study Design and Sample Table

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Factor</th>
<th>B</th>
<th>C</th>
<th>Age(Year)</th>
<th>Identification</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A₁ (Employed Mothers)</td>
<td>C₁</td>
<td>C₂</td>
<td>6-8</td>
<td>A₁ B₁ C₁</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>(High SES)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₂</td>
<td></td>
<td>9-11</td>
<td>A₁ B₁ C₂</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>A₂ (Unemployed Mothers)</td>
<td>C₁</td>
<td>C₂</td>
<td>6-8</td>
<td>A₂ B₁ C₁</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>(Low SES)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₂</td>
<td></td>
<td>9-11</td>
<td>A₂ B₁ C₂</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Combined N =</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>200</td>
</tr>
</tbody>
</table>
All the subjects were taken from the regional language (Oriya) medium primary schools under Bhubaneswar municipality, the Capital city of the State; Puri municipality, an international tourist centre and Cuttack municipality, Commercial Capital of the State of Orissa.

With regard to the above mentioned three cities, these are fully urbanised, thickly populated and developed cities in the State of Orissa. There are a variety of Public and Government Schools in these three cities, where teaching is imparted in regional language (Oriya), national language (Hindi) and international language (English) medium. There are more number of Oriya medium schools comparing to other medium schools which are run by State Government in these three cities. Apart from this, almost all the families are maintaining their livelihood depending on the service occupation in public and private sector of the State and there are a number of families where both the parents are also working in these three cities.

Coming to the details, in the present study at the initial stage 600 children of both the sex belonging to Grade-II and Grade-IV of oriya medium primary schools under the municipalities in the above mentioned three
cities were contacted in their schools to obtain informations regarding their bio-data, age, caste, parental income, educational qualification of parents, occupational status of parents, maternal employment status, total family members and their present postal address randomly. Moreover, the investigator interviewed their parents to confirm the collected informations from the school records.

After getting a handful of such data of all the students, parental monthly income, parental educational qualifications and their employment status were arranged in a frequency distribution order. The cut off point for high SES group was decided to be above 75th percentile of the income distribution and for the low SES group cut off point was chosen below 25th percentile of the income distribution. As such the subjects having parental monthly income above Rs.3000/- (Rupees three thousand only) belonging to high SES group, whereas, the subjects belonging to parental monthly income below Rs.1000/- (Rupees one thousand only) belonging to low SES group.

Basing on this criteria subjects were selected from different schools for these two groups. After that an attempt was made to subdivide the selected sample in accordance with their maternal employment status. The
criteria for maternal employment status stipulated that
the mothers have been working at full time jobs, for at
least four consecutive years. In addition to that none of
the unemployed mothers had been held on a paid job. The
four subgroups of maternal employment and SES were closely
matched for age and grade. In grade II, the range of the
age was between 6 to 8 years and in grade IV, it was
between 9 to 11 years. The mean age level for grade II and
grade IV children independent of maternal employment and
SES were 6.45 and 9.47 years respectively.

The same procedure of frequency distribution was
followed for parental education. In this context, the
educational qualification of mothers of the sample
belonging to low SES group and high SES group were fixed
at below matriculation and above graduation respectively.
Where as, the minimum educational qualification of fathers
of sample belonging to high SES group was fixed at post
graduation level and above. But the educational
qualification for fathers of sample belonging to low SES
group was equal with the mothers of the same group.
Similarly, the children of the fathers and mothers
belonging to age group 30 to 40 years and 25 to 35 years
respectively were taken as sample. The mean age level of
fathers and mothers were 38.54 and 31.55 years,
### Table 2
Summary Data for Sample

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Variable</th>
<th>A₁ (Employed mothers)</th>
<th>A₂ (Unemployed mothers)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B₁ (High SES)</td>
<td>B₂ (Low SES)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C₁ (Younger)</td>
<td>C₂ (Older)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n=25</td>
<td>n=25</td>
</tr>
<tr>
<td>1.</td>
<td>Mean age (Years)</td>
<td>6.36</td>
<td>9.56</td>
</tr>
<tr>
<td>2.</td>
<td>Mean of Parental Income (Rupees)</td>
<td>4385.06</td>
<td>4545.00</td>
</tr>
<tr>
<td>3.</td>
<td>Mean age of fathers (Years)</td>
<td>37.50</td>
<td>39.25</td>
</tr>
<tr>
<td>4.</td>
<td>Mean age of mothers (Years)</td>
<td>29.72</td>
<td>29.80</td>
</tr>
<tr>
<td>5.</td>
<td>Mean education of fathers (Year of Schooling)</td>
<td>16.00</td>
<td>17.50</td>
</tr>
<tr>
<td>6.</td>
<td>Mean education of mothers (Year of Schooling)</td>
<td>15.00</td>
<td>15.00</td>
</tr>
<tr>
<td>7.</td>
<td>Mean employment status of mother (Years)</td>
<td>6.72</td>
<td>6.85</td>
</tr>
<tr>
<td>8.</td>
<td>Mean of family size</td>
<td>6.29</td>
<td>6.35</td>
</tr>
</tbody>
</table>
respectively. Afterall, all the samples were taken from two-parent families. The description of samples with their respective mean age and their parent's mean age, mean education (year of schooling), mean employment status of mothers, mean family size per group and mean income have been given in the table 2. It is clearly evident from the table 2 that children of employed mothers of high SES and high age group differed considerably with regard to the children of unemployed mothers of low SES and low age group. In each of the 8 subgroups 25 subjects were included. Thus the total sample was 200.

**Description Tests**

The present study aims at measuring both level-I and level-II abilities and academic achievement of children belonging to two age levels of employed and unemployed mothers. The test battery used in this study has also been used widely in cross-cultural context particularly in Orissa (Das, 1973a, Jachuck & Mohanty, 1974). In order to evaluate developmental differences in level of performance the test battery was composed of tasks suitable for both age levels. Tasks were selected to correspond to Jensen's level-I and level-II abilities. Measures of level-I ability included the Digit-Span (Forward) Test (Wechsler,
1949), the Free Recall Test (Jachuck and Mohanty, 1974), and the Serial Recall Test (Das, 1973). Test of level-II ability included Raven's coloured Progressive Matrices (Raven, 1938), the Digit-Span (Backward) Test, the Figure Copying (Iig & Ames, 1964) and a Clustering Test (Jachuck & Mohanty, 1974). The following are the description of the tasks used in the experiment.

**Raven's Coloured Progressive Matrices**

Raven's Coloured Progressive Matrices (RCPM) was developed in 1938 (Raven, 1938). The test has been widely used on as a nonverbal test of measuring ability. The test consists of 36 items of increasing difficulty. The tasks were presented visually as a sequence of pattern with one piece omitted. The child is required to complete the pattern by selecting appropriate match from a series of given alternatives. The total number of correct scores in three sets and the time taken to complete the test were recorded. The maximum scores for a subject would come to 36 as there are 36 problems in the test.

**Figure Copying Test**

This test was used and developed by Iig & Ames (1964) at Yale's Gesell Institute of child study, as a
measure of the school readiness. It measures the ability of the child to copy certain geometrical figures like circle, square, triangle, etc. (Appendix B). The test consists of ten geometrical forms of regularly increasing complexity which the subject must simply copy. There is one form per page of the 10 page test booklet. Subject is instructed to copy each form as nearly like the model as possible attempting all figures without time limit. Each drawing is scored on a 3 point scale ranging from 1 (low) to 3 (high) according to its approximation to the essential features of the figure. If the child just scribbles then he is given '1' mark. If he draws a figure that is not exactly accurate but fairly resembles the original one, he is given '2' marks. If he draws an exact and accurate copy of the original figure he is given '3' marks and if he leaves the answer sheet blank, he is given '0'. This test involves no memory factor since the figure to be copied is before the child at all time. In the factor analytic studies (Jensen, 1969), it appears to be a purely loaded test and therefore, is a measure of level-II ability. Das (1973a) Jachuck (1978), used this test in Orissa and also found a comparable factor loading.

Digit-Span Test (Forward and Backward)

These tests are supplementary subscales abstracted
directly from WISCR (Weschsler, 1974). In Digit Span (Forward) the experimenter reads out one digit per second a series of digits of increasing length beginning with three digits to a maximum of nine digits (Appendix C ). If the child is unable to recall any series of digits correctly he is given a second series of digits of identical length. When the child fails to recall correctly both the series of any one length, no further progress is made. Digit-Span (Backward) Series range from two to eight digits which the subject must repeat in reverse order and is scored in the same manner. The Digit-Span (Backward) test, which follows Digit Span (Forward), includes two unscored practice items to ensure that the subject understands the task. Digit Span (Forward) is a measure of level-I ability where as Digit span (Backward) involves some degree of level-II ability (Jensen, 1970), since some transformation of the input is required prior to the output.

**Serial Recall**

This test is designed to identify level-I ability since it involves only rote memory. Presented individually by the investigator, the subjects' task is to recall verbally, immediately following ward series
(Appendix D). There are 4 lists for each of four-five and six word series. The words are either acoustically similar (e.g., man, mad or mat) or neutral (e.g. day, hot and cow). Each series is scored for words in the correct serial position. For instance, if the list is number 1, and the subject recalls key, cow, pen, hot then his/her score is 1. If the sequence of recall is key, hot, pen, cow, then the score is 2. The maximum score is 60. The administration time for the test is approximately 4-6 minutes. Lists of words are verbally presented and the Serial Recall is tested immediately.

Associative Clustering in Verbal Free Recall

The test consists of set of 20 pictures of familiar objects representing four categories: animals, fruits, parts of human body and vehicles (Appendix A). The pictures are presented sequentially at approximately a '2' second rate and the subject names the items as they are presented. Immediately following the presentation of all the 20 pictures, the subject is given 90 second to recall the names of all the pictures he is shown. The recall of the subject is recorded serially. This test was originally developed by Bausfield (1953) to test the organisation capacity (clustering) of the individual. It is generally
found that words are recalled as clusters corresponding to categories. This test has been used by Jensen and Federikson (1973) both as level-I and level-II ability. In the present study following the standard procedure, the first three trials were taken as practice trials, and the amount of clustering in recall were computed on the basis of fourth trial. Ratio of repetition (Cohen and Bousfield, 1956) procedure was used to represent clustering in Free Recall.

According to Jensen (1972) Free Recall Test in associative clustering is one of the best of measuring level-I ability. This test was also used by Jachuck & Mohanty (1974).

**Academic Achievement Measures**

The just previous annual examination marks of the children in four compulsory subjects and the marks were taken to indicate achievement. Five Scores were obtained in all, four for each of the compulsory subjects and one total score combining all of them.

**Procedure**

Testing began during the first week of November,
1991, and was completed during last week of December, 1992. Data were collected from both the grades (2 & 4) separately from all the schools successively. For carrying out this research work, a permission from the Headmaster of schools was first obtained. Then the class teachers of the respective grades were contacted personally. After a brief orientation about the purpose of the research work, they were requested to co-operate during the period of data collection. Then the tests were administered in a quiet room in the school provided by the Headmasters in different schools. Each subject was tested in four different sessions, after the selection of samples on the basis of their maternal employment status, age, and socio-economic status. Raven's Coloured Progressive Matrices was administered in the first session. Digit-Span, both forward and backward, and Serial Recall Test were administered in the Second Session. In the third, Figure Copying, Clustering and Free Recall tests were given. The sequence of administration was same for all the children. The total testing time for each child was approximately 45 minutes. Before giving any test, the investigator talked to each child for a few minutes in each session. The children were also allowed to ask questions freely to the investigator. They were told that they had been selected to work on some tasks for children and that other children
like them had done well on these tasks; they should also try to do well. Care was taken to ensure, that the subjects had understood the instructions, thoroughly before the test was administered. At the end of the testing session each child was given small token of incentive like pencils, chocolates, etc. All the tests were administered individually except the Figure Copying test which was administered in group of five. After collecting data, particularly in the last session, the achievement scores of the children were obtained from the school examination records. All the compulsory subjects which were common to both the grades were taken into consideration. Four subject scores and one total score obtained in the examination were recorded.