METHODS OF INVESTIGATION

The present study brings to limelight the impact of environmental stimulation on temperament and learning ability of preschool children.

Walker (1985) states that methodology should specify method but only in order to justify their use for defined purposes in specified situations and circumstances.
3.1. Nature of the study

The present study is basically correlative in nature, giving due and equal emphasis to the relevant and pertinent aspects pertaining to the arena of temperament and learning ability of preschool children. According to Gupta (1988), correlation is an analysis of the covariation between two or more variables.

The factors which arose for consideration in this study are (a) temperament which comprises factors activity, emotionality and sociability and (b) learning ability.

For the present study, the correlation of home environment and school environment with temperament and learning ability are analysed.

ANOVA was applied to find out the variations of temperament and learning ability among districts.

3.2. Design of study

The methods used to test the hypotheses in connection with the present study are discussed under six sections namely (1) the sample (2) the tools (3) description of the tools (4) pilot study (5) data collection / main study procedure and (6) statistical technique.

3.2.1. The sample

Pillai (1989) says that sampling are devices for learning about large
masses by observing a few individuals. The course of investigation in the present study was set rolling by selecting 50 subjects from the upper kindergarten each from Trivandrum, Thrissur and Kozhikode districts since these are the Southern Central and Northern regions of Kerala.

The proper age group which was found most congenial and appropriate for the study was of five years since the rate of growth and development is fast at this stage, and any stimulation will have its maximum effect during the early childhood.

As the tests were time consuming, the sample size was reduced to 150. The subjects were collected from a cross section of the preschool group selected from different schools at Trivandrum, Thrissur and Kozhikode districts. It was decided to select five urban, co-education schools from each district and ten children were taken from each school.

For the present investigation the investigator, had to administer the tests directly with the children for measuring learning ability and since these tests were time consuming, those schools who were co-operative with the study were considered.

Selection of sample from each school was done using the technique of random sampling. In the view of Potti (1991) random sampling can be done by two methods, (a) lottery method (b) from the table of random numbers. For the present investigation, lottery method was used.
### Table 3.1

**Distribution of the sample in Trivandrum district**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of School</th>
<th>Type of School</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>1</td>
<td>Good Shepherd</td>
<td>Co-education</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Hari Sree</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Nirmala Bhavan</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Tiny Tots</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Trinity School</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

### Table 3.2

**Distribution of the sample in Thrissur district**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Name of School</th>
<th>Type of School</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>1</td>
<td>Sacred Heart</td>
<td>Co-education</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Holy Family</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>Nirmala Matha</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>Hari Sree</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Don Bosco</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>
Table 3.3

Distribution of the sample in Kozhikode district

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of School</th>
<th>Type of School</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>1</td>
<td>St. Pauls</td>
<td>Co-education</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Vimala School</td>
<td>&quot;</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Sucha Nilayam</td>
<td>&quot;</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Chempaka</td>
<td>&quot;</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Islahia</td>
<td>&quot;</td>
<td>5</td>
</tr>
</tbody>
</table>

Five co-education schools each from Trivandrum, Thrissur and Kozhikode districts were selected for the study. Equal number of boys and girls were selected from each school. A total number of 10 subjects have been considered from each school.
3.2.2. The tools

Selection of an appropriate tool is the most important part of conducting a research. The various tools used for the present study are as follows.

a) Questionnaire to measure the stimulation in the home environment for the parents developed by the investigator.

b) Questionnaire for the teachers to assess the stimulation in the school environment developed by the investigator.

c) Behavioural Style questionnaire developed by Mc Devitt and Care (1978) for assessing temperament.

d) Tests constructed by the investigator for measuring learning ability.

3.2.2.1. Construction of tools

No educationalist/psychologist is so far known to have developed a tool which includes the factors that had been considered in the present study for measuring the stimulation in the home and school environment.

It was decided to construct the tools for the present study. It includes two process (1) Preliminary processing (2) Secondary processing.

3.2.2.1.1 Preliminary Processing

It consists of three processes. (a) series of informal talk with the parents and the teachers of preschool children. (b) collecting information from the
available literature and (c) discussion with the experts in the field.

Considering the views of Agnihotri (1998) and Devi (1998), the factors which arise for consideration under home environment are exposure to objects and media, verbal and psychological interaction between the parents and children and the time spent together with the parents and children.

The questionnaire for measuring the school environment has been developed based on the views of Sylva and Lunt (1982). It comprises the factors availability of equipment in the school environment, time allotment for individual and group activities, teacher - pupil interaction and teaching methods.

Tests for learning ability have been developed taking into account the views of Hart and Milbreath (1982) which states that readiness tests to assess reading and writing should measure the ability to discriminate between alphabets, words, between objects, pictures and should also include the activities for drawing and colouring and others which help in the development of finer motor skills.

The Behavioural Style questionnaire developed by Mc Devitt and Care (1978) was used for measuring temperament.

3.2.2.1.2. Secondary processing

A pre - pilot study was conducted among fifteen preschool children inorder to know the areas which had to be included for the learning ability
tests. The tests given included the identification and matching of letters and words, identifying pictures, ability to trace shapes, to build structures using blocks, to make objects using colour papers, to thread the beads and to identify the missing letter of the words given. As children could not find out the missing letters of the words given, those questions were excluded from the tests constructed for learning ability. The questionnaire for the parents and teachers were also subjected to pre-pilot study and no modification was made in them.

3.2.3. Pilot study

A pilot study was undertaken immediately after formulating the tools for the present investigation. The pilot study was conducted among fifty preschool children with equal number of boys and girls. Questionnaire for the parents and teachers were also subjected to pilot study.

3.2.4. Reliability

Test-re test method was applied to find out the reliability of the learning ability tests. The reliability coefficients were calculated for the questionnaires given for the parents and teachers, using split half method applying Spearman Brown Prophecy formulae.

The reliability coefficients obtained for the tests constructed by the investigator using a sample of 50 children are shown in the following table.
Table 3.4

Reliability coefficients

<table>
<thead>
<tr>
<th>Test</th>
<th>Method</th>
<th>Co-efficient obtained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning ability</td>
<td>Test re test</td>
<td>0.92</td>
</tr>
<tr>
<td>Questionnaire for measuring stimulation in the home environment</td>
<td>Split Half</td>
<td>0.86</td>
</tr>
<tr>
<td>Questionnaire for measuring stimulation in the school environment</td>
<td>Split Half</td>
<td>0.90</td>
</tr>
</tbody>
</table>

A study of table (3.4) indicates that the reliability coefficient for all the tests constructed are significant. From this it is clear that all the tests used are highly reliable.

3.2.5. Validity

The questionnaires and the learning ability tests constructed by the investigator were prepared after a through review of literature on related topics. A first hand knowledge about the problem was acquired by the investigator by making informal interviews with the parents and teachers of the preschool children. The investigator discussed the various aspects of the problems with the experts in the field. Therefore content validity was taken into account in the present study as all the relevant content areas
were adequately represented in the questionnaires constructed.

3.2.6. Description of tools

3.2.6.1. To assess stimulation in the home environment

The stimulation in the home environment was measured using the questionnaire developed by the investigator. It consists of questions which elicit information regarding the stimulation given through the following factors.

(1) Exposure to objects and media
(2) Verbal interaction
(3) Psychological interaction
(4) Time spent (quantitative) among parents and children.
(5) Time spent (qualitative) among parents and children.

There were a total number of twenty five questions spreading five questions under each factor of home environment. The question numbers and the number of questions coming under each category are given in details in appendix I.

Scoring pattern

The questionnaire for measuring the stimulation in the home environment consists of twenty five questions. Each question is scored on a 3 point rating scale. The alternatives being most of the time, at times or rarely. The maximum score a child can get is 75 and the minimum score
is 25. The parents were instructed to tick the alternative which suits them most. Accordingly scores were awarded. The scores for each alternative are shown below.

<table>
<thead>
<tr>
<th>Most of the time</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>At times</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>1</td>
</tr>
</tbody>
</table>

For each aspect of home environment, the maximum score a child can be obtained is 15 and the minimum score is 5. The higher the scores obtained, the more will be the stimulation received.

3.2.6.2. To assess the stimulation in the school environment.

Questionnaire was developed by the investigator for measuring the stimulation in the school environment. It includes questions which elicit information regarding the stimulation given through

1. the availability of equipment (toys and educational materials)
2. time allotment for individual activities
3. time allotment for group activities
4. teacher - pupil interaction and
5. teaching methods

The questionnaire consists of a total number of twenty five questions out of which each five questions were to determine the five factors of school environment (vide appendix II).
Scoring pattern

The questionnaire to elicit information regarding the stimulation in the school environment consists of twenty five questions. Each question is scored on a 3 point rating scale, the alternatives being most of the time, at times or rarely. The maximum score a child can be obtained is 75 and the minimum score is 25. The teachers were instructed to tick the alternative which suits them most. The scores for each alternative are as follows.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of the time</td>
<td>3</td>
</tr>
<tr>
<td>At times</td>
<td>2</td>
</tr>
<tr>
<td>Rarely</td>
<td>1</td>
</tr>
</tbody>
</table>

The maximum score that each child can score for each aspects of school environment is 15 and the minimum score is 5. The higher the scores obtained, the more will be the stimulation received.

3.2.6.3. To assess the temperament

The Behavioural Style Questionnaire developed by Mc Devitt and Care (1978) was used for measuring temperament. It comprises of questions which elicit information regarding the (1) activity (2) emotionality and (3) sociability of children.

There were a total number of thirty questions scattering ten questions under each factor (Appendix IV).

The measurement of activity includes to assess whether the child
remains active or passive at different situations. Emotionality has been measured in terms of the frequency in which the child change his emotions and the intensity of the emotions expressed. Sociability in the present study includes the tendency to form friendships and associations, to cooperate and converse socially with others and to join groups. Temperament is measured in terms of higher activity, higher sociability and emotional stability.

Scoring pattern

The questionnaire for measuring temperament consists of thirty questions. Each question is scored on a 6 point rating scale, the alternative being almost never, rarely, usually does not, usually does, frequently and almost always. The parents were instructed to cross the alternative that is best suited for their child. Accordingly scores were awarded to the children. For a positive behaviour, almost always get 6 and almost never gets one and the vice versa for the negative behaviour. For activity, emotionality and sociability the maximum score a child can be obtained is 60 each and minimum score is 10 each.

Thus a child can score a maximum of 180 scores and a minimum of 30 scores as a whole for all the three factors. The higher the score indicate higher activity level, higher sociability and higher emotional stability.

3.2.6.4. For measuring learning ability

Learning ability was measured using the tests developed by the
investigator. It includes fifteen items which determine the readiness of the children to perform activities related to reading and writing. The test comprises of the following aspects (vide Appendix III)

(1) Identification of letters and words
(2) Identification of objects and pictures
(3) Tracing shapes
(4) Building structures using blocks
(5) Making objects using colour paper
(6) Threading the beads
(7) Colouring pictures
(8) Matching letters and words

Children are to be called individually and the materials for administering the tests are to be given one by one.

Scoring pattern

For the first three questions which involves the identification of letters and words, a maximum score of 6 and a minimum of zero are given. The fourth question to identify the odd one has given a maximum score of one and a minimum score of zero. Matching the letters in the fifth question has given one mark for each right answer, thus giving a maximum score of 10 and a minimum score of zero. The sixth and seventh question has given a maximum score of three and the minimum of zero. For finding out the lengthy word in the eighth question, a maximum score of three and a minimum score of zero is given. The maximum and minimum scores that
can be obtained for the ninth question are three and zero. For the tenth question, four and zero are given for the maximum and minimum scores respectively. For the 11th, 12th, 14th and 15th questions, a maximum score of three and a minimum score of zero are given. A maximum of 6 marks and a minimum of zero is given for the 13th question.

The higher the score obtained the better will be the ability to learn.

3.2.7. Data collection procedure

3.2.7.1. Main study

The main study was conducted after establishing the reliability and validity of the tools. The temperament and learning ability of 150 preschool children of five schools each from Trivandrum, Thrissur and Kozhikode districts were assessed using the respective tools. Permission to carry out the studies in the schools were sought in advance from the school authorities. The time was also fixed to conduct the investigation in each school.

As all the tests were individuals, it was decided to conduct them in a separate room near the class room. For this purpose all necessary arrangements were done and children were called individually and after developing a rapport with them, tests were administered. After that, questionnaires for the teachers and parents were given. The questionnaire for the parents were handed over to them by the respective teachers. They were collected back after three days. The study was completed in a time frame of six months.
3.2.8. Statistical technique

The data collected were compiled and analysed statistically. The important statistical techniques used in the present investigation to facilitate the analysis and interpretation of data are

1. Anova
2. 't' test
3. Correlation

ANOVA was administered to find out whether there is any significant difference in the total scores obtained among districts with regard to dependent and independent variables.

't' test was used for comparing the scores obtained for each factors among districts. The formula used for calculation of 't' is

\[
\begin{align*}
    t &= \frac{x_1 - x_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \\
\end{align*}
\]

Pearson's coefficient of correlation was used to find out the correlation of each factors of home and school environment with the study variables. The formula employed for calculation of Pearson's co-efficient of correlation was

\[
\begin{align*}
    r &= \frac{N\Sigma xy - \Sigma x \times \Sigma y}{\sqrt{(N\Sigma x^2) - (\Sigma x)^2} \sqrt{(N\Sigma y^2) - (\Sigma y)^2}} \\
\end{align*}
\]

Where 'N' is the total number of samples.