DESIGN AND METHODOLOGY

DESIGN:

The present investigation was designed to study the Effects of Anxiety (Test) and Intelligence on laboratory learning and real life learning (academic achievement).

A factorical design was used which consisted of two levels of anxiety: high and low, as measured by Hindi Version of TASC (Sarason, 1960) high and low Intelligence as measured by General Mental Ability Test, formed by Jalota, (1972). A $2 \times 2$ (AxB) factorical design was employed, where A stands for anxiety and B for intelligence. The main effects as well as interactive effects of anxiety (test) and intelligence on learning and academic achievement were studied. The research design was as follows:

\[
\begin{array}{c|c|c}
\text{Intelligence (B)} & \text{(Low)A}_1 & \text{High A}_2 \\
\hline
\text{Low B}_1 & A_1 B_1 & A_2 B_1 \\
\text{High B}_2 & A_1 B_2 & A_2 B_2 \\
\end{array}
\]

A laboratory learning task of concept formation was under in the present study. A concept formation
task is more meaningful and closer to real life learning than other types of laboratory learning tasks. A very important part of learning in real life situations depends upon the individual's ability to form accurate concepts. The criteria for learning on this task was kept at one errorless trial or a maximum of ten trials. Achievement scores in final exams of the previous year were collected from various school records, which served as dependent variable in the analysis of variance for achievement.

It was assumed that difficulty of school examination was of moderate level, so that students at every intelligence level able to achieve some scores.

SAMPLE

(A) Preliminary Sample:

A sample of 279 students studying in IXth grade was drawn from various schools. A large sample was mainly taken to pick up extreme groups of intelligence-anxiety combination for the investigation. These schools were fairly representative of the urban schools of Haryana. The students studying in these schools come from different socio-economic status groups. There were 109 boys and 170 girls in the preliminary sample.
These subjects were tested on the Hindi Version of TASC (Sarason, 1960) and the General Mental Ability Test (Jalota, 1972). Subjects were assured that their results would be kept secret. The TASC was administered first. Instructions were given to the subjects as to how to answer the questions. When all the subjects had understood the instructions, they were told to start. There was no time limit set for this test. It was however, completed within an average time of 12-15 minutes.

After this, the intelligence test was administered. The instructions were read out to the subjects and the examples given at the next page were discussed with the students. When all the subjects had understood the examples, they were told to start. Since this test had a time limit set for 20 minutes the Ss were informed from time to time about the passing minutes, so that they could increase their speed accordingly.

The scoring for TASC and the scoring of Jalota's General Mental Ability Test was done according to the scoring procedure provided by the authors' of the test.

**FINAL SAMPLE:**

The 2x2 factorial design provided for four combinations of the independent variables of anxiety.
and intelligence. A total of 60 Ss for the final sample were selected on the basis of their scores on anxiety (test) and intelligence tests. Extreme groups were formed by taking Ss scoring above and below mean ± ISD on anxiety test. For the intelligence test a different pattern was adopted. For the HI group, Ss scoring above mean + 1 SD were selected, and for the LI group Ss scoring below mean + 2 SD were taken, the reason being that the mean for intelligence scores was as high as 67.54. This meant that below mean - 1 SD i.e. 53.74, would like the low intelligence group. This score in essence is indicative of average mental ability. So, the Ss scoring below mean - 2 SD units, were selected as Ss for the LI group. The extreme values scored for anxiety were 20.39 and 10.53; for intelligence, values were 81.74 and 39.94.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Mean+1SD</th>
<th>Mean-1SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>15.46</td>
<td>4.93</td>
<td>20.39</td>
<td>10.53</td>
</tr>
<tr>
<td>Intelligence</td>
<td>67.54</td>
<td>13.8</td>
<td>81.74</td>
<td>53.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>39.94</td>
</tr>
</tbody>
</table>

Table-1.
Means and SD's of 279 Ss on Anxiety and Intelligence Tests.
Thus, four experimental groups were formed as followed:

High-Anxiety - High Intelligence (HA-HI)
High Anxiety - Low Intelligence (HA-LI)
Low Anxiety-High Intelligence (LA-HI)
Low Anxiety-Low Intelligence (LA-LI)

Table-II

Table of Means and SDS of the Four Experimental groups

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Ss</th>
<th>Anxiety</th>
<th>Intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>HA-HI</td>
<td>15</td>
<td>22.66</td>
<td>1.85</td>
</tr>
<tr>
<td>HA-LI</td>
<td>15</td>
<td>23.6</td>
<td>3.26</td>
</tr>
<tr>
<td>LA-HI</td>
<td>15</td>
<td>7.67</td>
<td>1.88</td>
</tr>
<tr>
<td>LA-LI</td>
<td>15</td>
<td>9.2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

These four groups of 15 Ss each were selected such that a) the high and low anxiety groups had similar distribution of intelligence scores, (b) the high and low intelligence groups had approximately the same distribution on TASC scores.

These Ss were then given a concept formation task to learn. Their scores obtained on the task and
their achievement scores in the last exam were then subjected to analysis of variance as dependent variables for main as well as interactive effects of anxiety and intelligence.

Table-III

<table>
<thead>
<tr>
<th>SAMPLING DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of Ss</td>
</tr>
</tbody>
</table>

Total No.of Ss (60)

<table>
<thead>
<tr>
<th></th>
<th>HA (30)</th>
<th>LA (30)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HI (15)</td>
<td>LI (15)</td>
</tr>
<tr>
<td></td>
<td>HI (15)</td>
<td>LI (15)</td>
</tr>
</tbody>
</table>

TOOLS USED:

A. Hindi Version of Test-Anxiety Scale for Children (TASC).

The test Anxiety Scale for children (TASC) was developed by Sarason (1960). It provides reliable, relatively brief, self-report measures of test-anxiety experienced by a large number of students.

The TASC and General Anxiety Scale for children (GASC) were developed in connection with a project on anxiety by Sarason and his co-workers (1960). They made
several predictions emerging out of the theoretical position taken by them and conducted a number of relevant studies to prove these predictions. It was therefore, assumed that the TASC and the GASC possess adequate construct validity.

For purposes of facilitating research on the Indian population, the TASC was translated in Hindi. In preparing the hindi translations of these two tests, essential content of the original TASC and GASC items was maintained. Apart from reliability and validity considerations, some items were revised to bring them more in line with our cultural set-up (Nijhawan 1973).

The TASC consists of 30 statements which ask children to respond according to how they feel during the testing situation and during any other particular moment. The 11 lie items of GASC when added made the total number of statements in the TASC to be 41. The categories for responding to the items were 'Yes' and 'No'. The scoring was done according to the procedure prescribed by the authors' of the test.

B. Jalota's General Mental Ability Test:

Jalota first prepared a test of general ability
in 1950, with 100 items. The items were mixed and arranged in an empirically determined order of increasing difficulty. This test has been in use since 1951, in a variety of school situations in the Hindi speaking areas of North India. The test results appear to have been found satisfactory by many Ph.D candidates, who have used them in academic research studies. This test was revised in 1971 by Jalota.

Jalota's General Mental Ability Test is a reliable and valid test. It was found to be equally valuable and suitable to the assessment of the undergraduate classes in the colleges and universities of Hindi speaking areas.

In the scoring of this test an overall assessment was made by awarding a score of 1 to each correct response, irrespective of the category to which the item belonged.

C. Hanfmann and Kasanin's Concept Formation Task:

The Concept Formation Task by Hanfmann and Kasanin (1942) is the laboratory learning task which will be used in the present investigation. It is based
on the vigotsky test of conceptual thinking.

The problem situations presented in the test are at a more difficult and higher level of abstraction than those in the Goldstein series. Since these problems make greater demands upon persons of higher mental levels, they may reveal deterioration in conceptual thinking that would still be unapparent in the subjects' long established responses for meeting familiar situations. The Hanfmann-Kasanin test provides a means of observing behaviour in a controlled situation and of obtaining information of some significance, to be added to other psychological data.

This test consisted of 24 wooden blocks differing in colour, shape, size and height. Under each was a nonsense syllable. Those which belong to the same category had the same syllable. The S was expected to learn to form these categories gradually. In the present investigation a trial limit was kept. The Ss were to be given only 10 trials to accomplish and learn the task.

The scoring was done on the basis of total trials taken by the S and the total number of errors made in the process of learning the task. Analysis of variance of
both these variables was found separately with anxiety and intelligence.

D. Academic Achievement:

Academic Achievement data consisted of aggregate marks secured in the annual examination. They were obtained from the record registers of the schools concerned. Preliminary sample taken was 279 Ss. The sample was representative of urban schools of Haryana. The schools had uniformity of school courses, methods of teaching, methods of conducting examination etc. In order to control teacher's bias, the achievement scores of VIII th grade were considered which were based on a uniformly conducted examination by the Haryana Board of School Education. The results of such examinations have been found to be fairly reliable (Sharma, 1970). This data for achievement was analyzed to determine the main effects of anxiety and intelligence and also their interactive effect on school performance.

PROCEDURE :

A. Procedure and Administration of tests (TASC and Jalota's GMAT)

The TASC was administered in the class on all the
students together. They were given some instructions related to the test. They were told, "This test is a very simple and interesting one. There are a number of statements given, to which you have to answer in 'Yes' or 'No'. If you feel that the statement explains your feelings at a particular moment correctly, mark a sign (✔️) against 'Yes' and if you feel that the statement does not explain your feelings, mark it (❌) against 'No'.

There was no time limit in this test, but the Ss completed it quite soon. They took an average of 12-15 minutes in answering the questions. The Ss who obtained high scores on the lie items (6 and above) were rejected. The other Ss responses were scored. On the basis of the mean and SD, the Ss were divided into two extreme groups of HA and LA lying above mean ± 1 SD unit.

Jalota's test of general mental ability was administered in the class on all the students present. They were assured of the secrecy of their results. They were told that, "This is an ability test. You will have to answer 100 questions in this test in 20 minutes. The questions are very easy and before starting the test I will go through the examples given on the next page and discuss them with you. You do not have to write on the
question booklets. The number of the correct answer to each question has to be written on the answer sheet provided to you".

The Ss were asked to start only when their doubts had been cleared. Since the test had a time limit, the subjects were told the time after a few minutes, in order to enable them to speed up their performance. The answer sheets and booklets were taken after 20 minutes and no student was allowed to continue with his task. After scoring, the Ss were divided into two extreme groups (HI and LI).

The Ss for the final sample were selected on the basis of their scores on TASC and Jalota's GMAT. The analysis of the scores obtained on both these tests were done in conjunction with those obtained on the learning task of concept attainment and academic achievement scores.

C. Procedure and Administration of Hanfmann and Kasanin's concept formation Test:

The Hanfmann and Kasanin (1942) test of concept attainment consisted of 24 wooden blocks which differed in
colour, shape, size and height. This test was administered individually on the Ss. They were told that, "this test consists of 24 wooden blocks which differ in size, shape, colour and height. All you have to do is to divide them into four groups, keeping the differences between them in mind".

The basis of categorization was height and size of the blocks. The four categories were large and tall, tall and small, flat and large, and flat and small. The basis of categorization was not disclosed to the Ss. After each trial the Ss were told whether or not the blocks belonged to the proper category or not. This procedure was followed till the Ss learnt the proper classification of each block.

A total of 10 trials were given to each S. The errors that the S made in each trial were noted. Analysis was made with anxiety and intelligence scores for the dependent variables of number of trials taken and total frequency of errors committed during the process of learning.