CHAPTER-IV

METHOD

Design:

In the present study, a factorial design of 2x2x2x2 was employed. There were two personality groups, neurotics and stables, henceforth to be called N and S. The two levels of fear of success were high and low fear of success. Motivation was varied in terms of motivating instructions and task instructions. Lastly, working women and university women were included in the sample in equal number. In all there were 16 conditions. In each of the 16 cells 15 subjects were used, thereby yielding a total sample of 240 subjects. The tasks used for experimentation consisted of six problems. These problems were:

1. Horse trading problem (adapted from Maier and Solem, 1952).
2. Train problem (adapted from Maier and Janzen, 1969).
6. Anagrams (adapted from Dominowski, 1966).

Apparatus:

   The SPM (1960) was used for controlling the factor of intelligence. It consists of 60 problems divided into 5 equal
sets of 12 each which become progressively more difficult. The stress is mainly on "capacity to form comparison, reason by analogy" (Raven, 1960). The test has been often used in India. Some of the reported studies are (Madan, 1967; Mohan and Suri, 1972; Mohan, 1972; Mohan and Kumar, 1973a, 1973b; Kumar, 1975; and Kumari, 1988).

2. **Eysenck Personality Inventory-EPI (Eysenck and Eysenck), 1964:**

Eysenck personality Inventory was used to select personality groups-neurotics and stables. The inventory consists of fifty seven questions. Twenty four are for extraversion/introversion; twenty four for neuroticism/stability and nine for lie scale. Scoring is done with the help of its key.

3. **Fear of Success Scale (FOSS) (Zuckerman and Allison, 1976):**

This scale was used to classify subjects into high fear of success and low fear of success groups. It consists of 27, seven point agree-disagree statements. These statements describe (a) the benefits of success (e.g., When you are on the top, everyone looks up to you), (b) The cost of success (e.g., I believe that successful people are often sad and lonely) and (c) the respondents attitude towards success when compared to other alternatives (e.g., The rewards of successful competition are greater than those received from cooperation). The
individual items are scored in the direction of high fear of success. For sixteen items, agreement was keyed as high fear of success; for the remainder, disagreement was keyed as high fear of success. Potential scores on FOSS range from 27 to 187.

4. **Problem Solving Tasks:**

In the present investigation six problem solving tasks were used. Out of these tasks five tasks, i.e., horse trading problem (Maier and Solem, 1952), train problem (adapted from Maier and Janzen, 1969), gold chain problem (adapted from Maier and Casselman, 1970), Bhatia squares (Bhatia, 1955) and prisoner's problem (Maier and Janzen, 1969) involve insightfulness (Maier and Solem, 1952; Maier and Janzen, 1969; Maier and Casselman, 1970; Bhatia, 1955; Kumar, 1975; Kumar and Kapila, 1987). This means that while solving these problems the subjects are required to discover a general rule of pattern of relationships.

The remaining problem solving task, i.e., anagrams (adapted from Dominowski, 1966) involve sets which require subjects to make a specified response to a specified stimulus (Luchins and Luchins, 1959; Kaplan and Schoenfeld, 1966; Dominowski, 1968; Johnson, 1972; Kumari, 1988). The brief account of these seven problem solving tasks is presented as under:-
Horse Trading Problem (Maier and Solem, 1952):

It is a mathematical problem presented in the form of horse transaction. A person is supposed to buy a horse for a certain amount of money and then sell it on the profit of say Rs. 10, then buy it back and again sell it on the same amount of profit. The solution of the problem requires the perception of the two transactions with two horses rather than two transactions with one horse.

The Train Problem (Adapted from Maier and Janzen, 1969):

In this problem a subject is required to tell the number of trains he will meet while travelling from one station to another, when the trip takes six hours and a train leaves each station bound for the other station after every hour.

The solution of this problem requires the idea that in boarding the train one would meet more trains than if one remained stationary.

The Gold Chain Problem (Adapted from Maier and Casselman, 1970):

In this problem a subject is required to solve a problem on the payment of 30 links long gold chain, at the rate of one link per day in exchange of the use of something else for the period of 30 days. The payment is to be done without cutting too many links.
The common error is making a rather large number of cuts. The solution involves the idea of making a change, so that only links 3, 9 and 21 need be cut.

**The Problem Squares (Bhatia, 1955):**

This problem consists of a big square made up of twenty nine broken lines making nine small squares in all. Each square on the corner and the central one also is divided by a diagonal broken line. The subject was supposed to trace all the lines without lifting the pen and without retracing any line.

**Prisoner's Problem (Maier and Janzen, 1969):**

In this task there are equally divided 16 cells. These cells are supposed to be in a prison. In each cell a prisoner is living. The upper left corner cell is marked with an 'x'. The prisoner residing in that cell goes mad and starts killing other prisoners in other cells. The killer has to reach the last cell marked with 'o' in lower right corner after killing everyone. He can only break the wall which separates the cells not the corner of the outside wall. Neither he can go back to the cell in which he has already killed a prisoner nor he can displace the dead body.

The answer sheet showed a square area divided into 16 cells four cells per row. The cell 'x' was located at the top left and cell 'o' at the bottom right.
The solution requires that the killer must return to his own cell after killing the first man. Since this is the only cell that does not contain dead body.

6. **Anagrams (Adapted from Dominowski, 1966):**

An anagram consists of several letters which a subject must rearrange to form a word. Generally, (Johnson, 1966) the solution word must use all the letters of the anagram.

Several attempts have been made to account for the difficulty of anagrams in terms of their structural properties. Dominowski (1966) proposed that letter moves (i.e., the number of letters whose position must be changed to get a correct solution) might be related to solution difficulty. Thus for the word Camel, the anagram mceal can be solved with a minimum of two moves, i.e., 'c' the first position and 'a' to the second while 'mclea' requires three moves. The fewer the moves the better was the performance.

In the present study 30 anagrams were used with 2, 3 and 4 moves in line with the contention of Dominowski (1966).

**Selection of the Sample:**

The SPM (Raven, 1960) was administered to 750 university women and 750 working women. The subjects were tested in groups. The oral instructions were given to them to look at each of the incomplete patterns, select the right answer out of the given set of the probable answers and record it on the answer sheet against the space provided for the same. Though
there is no fixed time prescribed in the manual, still a time of about 30 minutes was provided for completion of the test to maintain the uniformity in the group.

The responses given by the subjects on the answer sheets for each of the five sets were scored with the help of the standard scoring key of the matrices. The total number of problems correctly solved by the subject gave her score on the Standard Progressive Matrices.

Subjects scoring between 55th to 95th percentile were selected for further testing.

The means and SDs obtained by the 240 subjects in two personality groups, two fear of success groups, two motivation groups and two groups of women are presented in Table I. The t-ratios were also calculated to test the homogeneity of the different groups on SPM scores. Since none of the t-ratios were found to be significant, one can say that the groups were homogeneous as far as the variable of intelligence is concerned.

The 1000 subjects selected on the basis of their scores on SPM were administered EPI (Eysenck and Eysenck, 1964). The subjects were tested in groups. The following instructions were written on the personality inventory and were also read out to subjects for clarification:


**TABLE-I**

**MEANS AND STANDARD DEVIATIONS OF SCORES ON SPM OF THE 2 PERSONALITY GROUPS, 2 FEAR OF SUCCESS GROUPS, 2 MOTIVATION LEVELS AND 2 GROUPS OF WOMEN:**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>SD</th>
<th>t-ratio</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personality groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurotics</td>
<td>43.02</td>
<td>5.98</td>
<td>0.93</td>
<td>NS</td>
</tr>
<tr>
<td>Stables</td>
<td>43.70</td>
<td>5.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fear of Success Groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High fear of success</td>
<td>43.99</td>
<td>5.45</td>
<td>1.70</td>
<td>NS</td>
</tr>
<tr>
<td>Low Fear of success</td>
<td>42.73</td>
<td>5.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motivation Levels</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivating Instructions</td>
<td>43.29</td>
<td>5.82</td>
<td>0.21</td>
<td>NS</td>
</tr>
<tr>
<td>Task Oriented Instructions</td>
<td>43.43</td>
<td>5.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Groups of Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Women</td>
<td>42.67</td>
<td>5.40</td>
<td>0.87</td>
<td>NS</td>
</tr>
<tr>
<td>Working Women</td>
<td>43.05</td>
<td>5.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Here are some questions regarding the way you behave, feel and act. After each question you are supposed to encircle 'Yes' or 'No'. Try to decide whether 'Yes' or 'No' represents your usual way of acting or feeling. Then put a circle around 'Yes' or 'No'. Work quickly and do not spend too much of time over any question. We want your first reaction, not a long drawn out thought process. The whole questionnaire should not take more than a few minutes. Be sure not to omit any question. There are no right or wrong answers and this is not a test of your intelligence or ability but simply a measure of a way you behave.

Three types of scores were obtained on EPI namely on neuroticism, extraversion and lie scale. Subjects scoring within Mean ± 1 SD on E/I and at the same time scoring above and below Mean ± 1 SD on Neuroticism dimension were defined as neurotics and stables. The subjects scoring more than 12 and less than 8 on Neuroticism dimension and at the same time scoring between 8 and 12 on E/I dimension were termed as neurotics and stables respectively and were selected for further testing. The criterion used for selection of sample on EPI is in the line with the norms of the university population (Kumar 1975). For the present sample the means for N and E/I dimensions were 10.8 and 11.0 respectively and the
SDs for the two dimensions were 4.00 and 5.20 respectively. These means and SDs are in line with the norms of the university population.

These selected subjects on the basis of EPI were then administered fear of success scale. The following instructions were written on the scale and were also read out to the subjects for clarification:

"In this questionnaire you will find a number of statements. For each statement a scale from 1 to 7 is provided, with 1 representing one extreme and 7 the other extreme. In each case, circle a number from 1 to 7 to indicate whether or not you agree with the statement. This is the measure of personal attitudes. There are no right or wrong answers. Please answer all items."

There was no time limit and scoring was done with the help of scoring key.

On the basis of the obtained scores, the subjects were divided into two groups. The subjects scoring above Mean + \( \frac{1}{2} \) SD were classified as high fear of success group and subjects scoring below Mean - \( \frac{1}{2} \) SD were classified as low fear of success group. The means and SDs for the total sample was 108.43 and 25.00 respectively. Thus the subjects scoring above 121 were classified as high fear of success group and subjects scoring below 96 were classified as low fear of success group.
Now in all four groups were formed - neurotics with high fear of success, neurotics with low fear of success, stable with high fear of success and stables with low fear of success. 240 subjects were selected with 60 subjects in each group.

The selected 240 subjects were individually experimented upon using six problem solving tasks. The two levels of motivation were instructionally induced during experimentation. This technique has been recognized as highly effective and has been successfully used by Brown (1961), Mohan and Damral (1971), Mohan and Gupta (1972), and Kumar (1975, 1983).

For two levels of motivation following instructions were given:

Motivationally oriented Instructions:

For the condition of high motivation, subjects in half the sample were told that the task involves a test of their ability and they have to perform as best as they can. They were encouraged if stuck at any place in between and were told to perform the experiment patiently.

Task Oriented Instructions:

For the condition of low motivation the other half of the subjects were instructed only for the task that had to be performed.
Problem Solving Tasks:

Instructions for the six problem solving tasks were written on the top of the paper, on which the figures of problems were printed. In case the subject was not able to understand the problem, oral explanation was given. The instructions for each of the six problems are stated below. A rest pause of two minutes was given after every problem. For problems, I, II and III (Horse Trading, Train and Gold Chain Problem) the following instructions were given:

"Here are three problems, you will have 15 minutes to work on them. You may do any rough work that you feel is necessary on the problem sheet. Alternatives are given at the end of each problem. Tick the alternative which you feel is the correct one".

Horse Trading Problem (Maier and Solem, 1952):

A man bought a horse for Rs.60/- and sold it for Rs.70/-. Then he bought it back for Rs.80/- and sold it for Rs.90/-. How much money did he make in the horse business?

Alternatives:

(a) Lost Rs.10/-
(b) Made no loss-no profit.
(c) Made Rs.10/-
(d) Made Rs.20/-
(e) Made Rs.30/-

The correct answer was that he made Rs.20/-. 
The Train Problem (Adapted* from Maier and Janzen, 1969):

A train leaves Chandigarh bound for Delhi every hour and a train leaves Delhi for Chandigarh every hour. The trip takes six hours. How many trains will you meet coming from Delhi if you take the train in Chandigarh bound for Delhi.

Alternatives:
(a) Five (b) Six (c) Seven (d) Eight (e) Nine (f) Ten,
(g) Eleven (h) Twelve (i) Thirteen (j) Fourteen
(k) Fifteen.

The answers eleven, twelve and thirteen were taken as correct.

The Gold Chain Problem (Adapted** from Maier and Casseleman 1970).

Raghu had a gold chain 30 links long which was admired by Shayam. It was planting time at Raghu's farm and he asked to borrow Shayam's tractor. Shayam said he would let him use the tractor for 30 days in exchange for the gold chain. It was agreed that Raghu pay Shayam at the rate of one link of

* In the original problem the names were Chicago and Detroit but in the adapted version the names have been changed to Chandigarh and Delhi.

** In the original problem the names were Mr. Jones and Mr. Smith, but in the adapted version, the names have been changed to Raghu and Shayam and the 'tractor' has been used instead of 'mule'. 
gold chain per day. However, he would not give him the whole chain at the outset in case the tractor should get out of order. Shayam was unwilling to wait for payment until the end of the period. Finally it was agreed that Raghu would pay Shayam a link each day, providing this could be done without cutting too many links. What is the fewest number of links Raghu would have to cut in his chain and still pay Shayam a link each day?

The solution involves the idea of making a change, so that only links, 3, 6 and 21 need be cut.

Problem Square (Bhatia, 1955):

Please trace the square with its small lines without lifting your pen and without retracing any line already crossed. You may start from any point, but you must complete the figure.

Prisoner's Problem (Maier & Janzen, 1969):

Below is a diagram showing the arrangement of cells in a prison. One day the prisoner in the cell marked with an 'x' went mad and wanted to kill every one. So, he broke through walls which separated the cells and murdered the prisoners. After each killing he would drop the dead body on the spot and go on to the next cell. He could not stand the sight of a dead man so he would never go into a cell containing a dead body. Every cell contained a prisoner, and he would never break through an outside wall or a corner.
When the authorities finally arrived, he had just killed the last man, in the cell marked with 'o'. Show in the diagram a path he might have taken to arrive at that cell).

After this the subjects were given a rest pause of 5 minutes before going on to the next problem.

Anagrams (Dominowski, 1966):

Below is given a list of 30 meaningless letters. Rearrange them to form 30 meaningful words.