Chapter IV
Design and Methodology

The present chapter gives an outline of the design and methodology used to test various hypotheses formulated in the last chapter.

In the present investigation multigroup design was used. The schematic of the design is as follows:

<table>
<thead>
<tr>
<th>SS</th>
<th>Before Measures</th>
<th>Color/Treatment</th>
<th>After Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIn=10</td>
<td>CFF</td>
<td>Working upon mental task under red color.</td>
<td>CFF</td>
</tr>
<tr>
<td>GIIIn=10</td>
<td>CFF</td>
<td>Working upon mental task under dark pink color.</td>
<td>CFF</td>
</tr>
<tr>
<td>GIIIIn=10</td>
<td>CFF</td>
<td>Working upon mental task under orange color.</td>
<td>CFF</td>
</tr>
<tr>
<td>GIVn=10</td>
<td>CFF</td>
<td>Working upon mental task under green color.</td>
<td>CFF</td>
</tr>
<tr>
<td>GVn=10</td>
<td>CFF</td>
<td>Working upon mental task under light gray color.</td>
<td>CFF</td>
</tr>
<tr>
<td>GVIn=10</td>
<td>CFF</td>
<td>Working upon mental task under white color.</td>
<td>CFF</td>
</tr>
</tbody>
</table>
Total Subjects

60

Red  Dark  Pink  Orange  Green  Light  White  Gray

\[ n = 10 \quad n = 10 \quad n = 10 \quad n = 10 \quad n = 10 \quad n = 10 \quad n = 10 \]

Fig. 1 Showing the sample breakdown
Fig. 2(a) Showing Experimenter's Side View of Critical flicker fusion apparatus.

Fig. 2(b) Showing Subject's side view of critical flicker fusion apparatus.
GSR readings of the subjects were also recorded while the subjects were working upon a span of attention task.

Sample:

A sample of 60 male and female post graduate subjects (20-23 years old) studying in M.D.University, Rohtak was selected at random. These subjects were further divided randomly into 6 groups, including ten subjects each as shown in figure 1.

Material used:

Flicker Fusion Apparatus:

TECHNO FF .3 Flicker Fusion apparatus was used to measure CFF in the present study. This apparatus consisted of a metallic cabinet with two sloping sides for the subject and the experimenter. The subject's side functioned as a screen for the subject. There was a viewing window on the subject's side and a press button switch to signal his response. The viewing tube showed a zero watt bulb inside the cabinet. The experimenter's side of the apparatus was fitted with a hand operated dial divided into 45 units from 5 to 50. The dial controlled the flickering rate of the bulb at the end of viewing tube. A red light flickered in consonance with the lights flickering at the end of the viewing tube. An answer back light was fitted on the experimenter side which lit up when the subject gave his response,
by pressing the red switch on his side. This instrument operated on 220/30 volts when connected to the mains through a servo controlled voltage stabilizer.

Psychogalvanoscope:

It is an apparatus meant to measure skin resistance. It consists of a metallic cabinet with semicircular pointer type display meter. The meter scale indicates -30 to +30 with zero point in the centre. The apparatus operates on four/six volts batteries fitted inside the cabinet. On the operating panel are fixed three structures: On-off, manual - automatic and low and high light sensitivity. It also has three balancing knobs meant for coarse, fine, and sensitivity fine balancing. The galvanoscope has the following accessories:

(a) Pair of electrodes
(b) Electro cardiograph Jalley
(c) Test block and jack with wires
(d) Sticking plaster

At first the sensitivity fine 'I' was balanced. The sensitivity was set at low sensitivity. The coarse balancing knobs were moved to the extreme counter clockwise position and the fine balancing was fixed mid way between the two extreme positions. The apparatus was set at Auto. The psychogalvanoscope was switched on. The deviations were reduced by coarse and fine balancing knobs. After sometime the pointer moves back to zero. In this way the preparation for recording the GSR were made by setting the psychogalvanoscope.
Fig. 4 Showing the shades of six colors used in the present study.
Task:

The task on which the performance of the subject was noted was span of attention. It consisted of mixed up numbers from 0 to 200. The task of the subject was to locate each number in the correct serial order. The time limit was 15 minutes. Since the purpose of experiment was to study the effect of hue on CFF and GSR, it was particularly checked that the task used should be very simple so that the task itself should not become an additive source of stress to color or hue affecting CFF and GSR.

Colored cabins:

For different color environment, a small cabin was used. The paper sheets were parted on all the sides of the cabin. The sides of the cabin were at one time covered with single colored sheets, when required number of subjects had worked under that particular color environment, the sheets were removed and the walls of the cabin were covered with another color. Like this six colors were used in all.

METHOD

It is clear from the design (p 22) that the CFF readings were to be taken before as well as after the task performance. Therefore, CFF readings were taken first of all. Keeping this in mind after rapport formation the subject was brought in a dark room. Two minutes dark
adaptation was done. The subject was given the following instructions. Here is an apparatus, in which you can see a viewing tube and a switch. You have to see the light at the end of the viewing tube and keep your hand on this switch. In this tube you will see a red light flickering constantly and after some time it would appear to be fused. When you observe this light to be fused, please press the button. Some times you will see a fused light that starts flickering after some time. You have to again press the button when you observe the light to be fused.

Four trial were taken in total; two in a ascending order and two in a descending order. In ascending order the flicker was set at 10Hz and $S$ was asked to see the viewing tube for one min. The spread of the flickering knob was increased until the red light appeared to be fused. The point at which the $S$ pressed the button was noted down. In descending order the flicker was set at 50 Hz, and the spread was reduced until the $S$ perceived the light as flickering light. After that the average of these four values was calculated.

After taking the readings of CFF the subject was brought in a cabin which was covered with Red color. The $S$ was seated comfortably, avoiding any direct contact with the ground. This was necessary for balancing the subject on the galvonoscope. The index finger of the subject was coated with electrocardiograph jelly and the two electrodes were taped around the finger.

After setting the Apparatus as mentioned earlier (p.27) the subject was instructed in the following manner, "this is a very simple task in which 0 to 200 digits have been presented in a jumbled order. You have to tick mark or cross these digits in a serial order. You
must keep in mind that you have to cancel the digits in the correct serial order. Do not skip any digit. You have to try and cancel as many numbers as you can in 15 minutes."

After giving these instructions the form was given to the subject and stop watch was started. The readings on the psychogalvanoscope were recorded after every one minutes. When the time was over the S was asked to stop and electrodes were removed from the finger of the subject. The color under which the subject had worked was noted down. In this way the same procedure was repeated under each color.

After finishing the task the subject was again brought to the darkroom and the CFF recording of the after conditions were taken in the same way. Like this the data on GSR and on span of attention was collected for the other five colors i.e dark pink, orange, green, light gray and white in a similar way. The data obtained in this way was tabulated in the master charts for statistical analysis.