CHAPTER VI

PILOT STUDY

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If the relationship of other variables is to be established with EOCV, the latter should be a reliable and valid measure. The researcher was initially interested to see if EOCV exists. It was to answer this question that the pilot study was conducted.

Measuring sensory experience is apparently simple but technically quite complicated. Traditional psychophysical techniques to determine the absolute and difference thresholds are in terms of the method of limits, the method of constant stimuli, and the method of average error (Guilford, 1954). The theory of signal detectibility has refined psychophysics especially because the traditional methods do not measure pure sensitivity alone (Green & Swets, 1966). Psychophysical scaling techniques provide a degree of measure in comparison with the variability in the nature of physical stimuli (Stevens, 1958). A greater degree of subjectivity limits the advantages of scaling methods (D'Amato, 1979).

In all these techniques the responses of the individual in terms of verbal reports are taken into consideration. Recent studies in consciousness have shown that the verbal reports are not always dependable: "Appearance in verbal report cannot be a sufficient indicator of conscious experience" (P. White, 1982, p. 13).

Averaged evoked potentials have eliminated the importance of verbal reports. The pure sensory experience of the individual is measurable thanks to instrumentation (Boddy, 1978). However, a mere sensory experience has no meaning or value to the individual unless it involves conscious experience as even unattended stimuli are processed by the brain.

When the measurement of common conscious experiences itself is so complicated, attempts to measure a phenomenon like EOCV would prove almost futile. As practical considerations reign supreme it becomes all the more confounded.
Several preliminary studies were undertaken by the researcher in modifying the apparatus and reorganizing the procedure for administration and scoring. A total of six sighted undergraduate students participated in the preliminary studies.

Keeping in mind the availability of resources and the time factor, this researcher has set out to devise a measurement tool and technique which costs practically very little; can be manufactured anywhere, both in rural and urban conditions; does not involve sophisticated technology; which does not depend upon the evasive electricity; is durable; and finally is environment-friendly and user-friendly. The time required to administer EOCV test is less than an hour. One sitting would be sufficient.

Once the apparatus and procedures were finalized the pilot study was planned and conducted in two stages.

Psychologists generally adhere to one of the following modes of verbal reports while measuring sensory experience:

1. Elaborative and analytical responses in terms of 'brighter', 'tastier', 'prettier', etc.
2. Direct mechanical response in terms of a 'yes-no'.

As Ericsson and Simon (1980) point out, the verbal report as data depends upon the activity that is investigated. The first type is used to study the effect of stimulus variation on the subject's consciousness as in psychophysical scaling methods. The second type is necessary to investigate the subject's awareness of the presence or absence of a stimulus as in the psychophysical methods.

For an initial attempt in understanding EOCV, this researcher decided to use both the modes of response. Hence the need for a two-stage study.
First Stage

In addition to the nature of responses latency time (Evans, 1985), that is the amount of time taken by the subject to respond to a stimulus situation, was measured in the first stage.

The stimuli were five color papers - red, yellow, green, blue, and purple pasted on cardboards measuring 11 cm by 11 cm. Each color was presented six times. The 30 presentations were randomized by referring to the Random Numbers Table (Kerlinger, 1978).

Nine sighted undergraduates participated as subjects in the first stage. They were instructed to respond to each stimulus (by keeping their fingers at least 4 cm away) in terms of a change in sensation. The maximum duration of exposure was 60 S only, within which if the subject did not respond the stimulus was withdrawn. The reaction time as well as the responses were noted down in the data sheet. None of the subjects were aware of being presented with color or any other material. They were asked to report what they felt.

Following are the summary of the tests conducted:

The reaction time for a given color ranged from as less as 4 S to as high as 43 S, with an average of 27 S approximately. The responses varied from one individual to another. The following are the responses by the nine subjects quoted verbatim:

Table 6.1 Cutaneous EOCV responses of nine subjects

| hot, sticky, hot in palm, magnetic effect, repelling of fingers, burning sensation in hand, pain in the hands, hand is going down, hot in body and cold in palms (simultaneously), fingers are trying to catch something, feeling free in the fingers, current is passing through the fingers. | cold, bit cold in the whole hand, obstruction, harder like stone, something running over palm and fingers, cold breeze, numb and cool, hand is becoming loose, fingers are going against each other though I am trying to hold them together, shivering |
A couple of subjects did not report any change even after one minute exposure. The same subjects sometimes reacted within a few seconds after the color was presented. Hence, a thorough categorization of reaction time in terms of each color is not done.

Categorizing responses with respect to each color separately has not been possible because the subjects gave varied responses to each color. For instance, red, which is typically supposed to elicit warm or hot sensation was sometimes reported to be cold, repelling, etc.

With further testing and analysis the researcher came to the conclusion that this is due to sensory adaptation. However, when subjects were told to rub their fingers after every tenth trial, the reaction time as well as the responses became relatively uniform.

The group consisted of one female subject aged 17 years who reported "no change" to all the colors in spite of repeated testing. The subject was later tested for color blindness, too. But she was found to be normal in color vision. Her 19-year-old sister reported changes in sensation to every color and she was also found to be normal in color vision. It is these type of mysteries that the researcher is interested in: what makes someone quite good in skin sensitivity to color and what makes another quite insensitive?

The results, in general, agree with other similar tests conducted elsewhere. For instance, Romains (1924) indicates an elaboration time of 30 S to 45 S. In a study by Buskov and Suzev who held colored paper 15 cm behind the subjects' heads it was found that the subjects reacted within 10 S (Gris & Dick, 1980). Though the responses were not strictly according to A. S. Novomeisky's (1965) classification, very similar type of responses were elicited. The responses were basically cutaneous in nature emphasizing warmth, cold, pressure, and pain, in that order. Thus, some extent of reliability and validity of EOCV measures were established during the first stage with nine volunteers.
However, the researcher was not satisfied as a greater degree of variability was absent from these measures. Predictions based on feelings alone would be insufficient in a controlled research. Either the subjects have to be trained specifically to give particular responses or hundreds of presentations of each stimulus condition are necessary.

There were other reasons, too. Conscious experience of a stimulus is processed at two levels. Evidence for the presence of such a dual processing comes from the studies on two equally intriguing phenomena as that of EOCV: blind sight and subliminal perception.

The paradox of blind sight rests in the verbal reports of the subjects. The subjects in question were cortically blind, yet they continued to have visual perception (Weizkrantz, 1977, 1980). One cortically blind patient, D. B., aged 34 years, has been studied extensively. His right visual cortex had been removed surgically resulting in a condition called hemianopia (Weizkrantz, Warrington, Sanders, & Marshall, 1974). Neurologically, he is expected to be blind in the left eye. As predicted, he reported that he saw nothing whenever stimuli were presented to his blind hemifield. However, a series of four experimental tests were given to him. The results contradicted the fact that he was not able to see in the left eye. He responded to visual stimuli presented to the blind field by refixating his eyes on a spot of light, reaching out with his finger accurately, guessing which of the two figures were flashed in his blind field, and guessing the presence of light in a forced-choice situation. Though he always reported that he saw nothing but merely guessed, the accuracy with which he responded to the stimuli in the blind field astounded the researchers. For instance, when asked to make a forced-choice between a cross and a circle that was flashed on to his blind field, he guessed 28 out of 30 correctly.
As it is quite obvious two contradictory responses are present: the patient reported seeing nothing but responded as if he saw what was presented. The same conclusion was drawn by Zihl (1980) after investigating several other cortically blind subjects; by Perenin and Jeannerod (1975) after testing six subjects with postgeniculate lesions; by Hecaen and Albert (1978) after observing a 62-year-old man considered to be totally blind but who was able to grasp an object in motion and indicate the direction of motion; and by Mestre, Brouchon, Ceccaldi, and Poncet (1992) after studying a 40-year-old male with bilateral lesion of visual cortex with damage to cortical areas V1 and V4 who perceived motion in the blind parts of the visual field.

In subliminal perception, the individual is not aware of the information presented subliminally and totally denies of having any knowledge about it. However, his responses otherwise tell a different story (Dixon, 1971; Nisbett & T. D. Wilson, 1977).

This accounts for a dual level of processing of information. Reports based on changes in sensory input were absent whereas those dependent upon the presence or absence of a stimulus, even when the subject was not aware of the nature of the stimulus, were quite significantly noticeable.

Thus, there are certain disadvantages in relying upon the first category of responses. When a person is asked to report based on feelings one has to say what one feels and when no feeling is present one need not make a verbal report. Such a response is complex and optional where the content depends upon the selection and generation of activities which are independent of the processes being studied (Ericsson & Simon, 1980).

As this amounts to introspection, subjectivity would be the number one suspect. The verbal report may or may not contain the actual experience; may not be accurate; may be
distorted, edited or elaborated; may contain other related experience; may be irrelevant and inconsistent. And above all, the report can never be cross-checked and depended upon. However, discussing the dichotomous approach to verbal reports by psychologists, P. White (1982) comments upon the fact that both the types of data are not totally dependable. He distinguishes between experience and knowledge and supports this distinction with empirical evidences.

Sperling (1960) has shown that the human visual system is capable of storing an entire stimulus pattern though the individual is exposed briefly to such information. And a given part of this stored information can be recalled by the individual accurately.

This, and the fact that subjectivity can be controlled through objective scoring, has induced this researcher to adopt the second category of verbal reports where the individual makes a decision in a forced-choice situation. Such data are more dependable as measures of conscious sensory experience. In addition, the amount of variability such reports provide is most essential for an exploratory research.

Another parameter for measuring EOCV is in terms of reaction time. Measurement of time is preferable in experimental psychology because of "the absolute nature of the time scale, which excludes arbitrary transformations" (Petrovsky & Yaroshevsky, 1987, p.260).

Reaction time is defined as "the time required to get the overt response started" (Woodworth & Schlosberg, 1976, p.8). It is the duration between the presentation of the stimulus and the response made by the subject. With regard to the sensory experience, what all happens in the individual's neuropsychological set up is measurable directly in terms of such latency time (Evans, 1985). Variability depends upon the nature of the stimulus and the capability of the individual.
Certain procedural problems and the influence of a number of relevant variables exist while measuring reaction time (Woodworth & Schlosberg, 1976). The researcher is aware of such problems and hence has decided to do away with it. These considerations prompted the researcher to proceed with the second stage of the pilot study.

Second Stage

In the second stage of pilot study, the researcher decided to reduce the number of stimuli. When the sensitivity to the presence or absence of color is the predominant consideration, testing the degree of sensitivity would lead to too many problems. As red and light blue are technically the two extremes of pigments in terms of electromagnetic radiation, these two colors were chosen.

Though colored paper elicits better responses from the subject than paint, using the former leads to certain disadvantages. One problem is about the wear and tear, especially when so many presentations have to be made to a number of subjects. Using new paper periodically would result in a change in the stimulus condition. For example, those who are exposed to new and bright colored paper tend to have greater advantage over the others exposed to a worn out colored paper. Hence painted wooden blocks were used in the second stage.

Responses to the two colors may be in terms of the color itself or in terms of cutaneous sensitivity. The first response is typically perceptual which goes beyond the scope of, and the assumptions behind, the present study. The second response would lead to too many complications, for instance, as, red may elicit warmth response in some and cold response in others.
A third alternative was chosen in terms of assigning numbers to the colors where blue was 1 and red was 2.

A design is not experimental if a control is absent. Thus a 'no color' situation was introduced in terms of blank which was assigned the number 0. Thus, if a subject is sensitive extraocularly to color, one would respond to color specifically and at the same time would also respond to the 'no color' indicating the absence of color. If EOCV is not present, the total number of correct responses would equal to chance. For instance, if a color is presented 15 times and a blank another 15 times, the total would be 15, as the subject responds in terms of change to some and no change to others whether the color is present or not. However, if EOCV is present in the ideal subject, the score would be 30 - 15 correct responses of change for color and 15 correct responses of no change for blank. An ideal score of zero, where the response for color is no change and for blank is change would indicate that the subject has EOCV, but is capable of missing it perfectly. Steinberg (1966) adopted this design to test the subject's sensitivity to light and dark situations and obtained an average score which did not differ significantly from chance.

A total of 12 subjects participated in the second stage. This consisted of three totally blind, one partially blind, and eight sighted subjects. All these subjects were also administered the tests on haptic sensitivity and spatio-motor ability as it was necessary to determine the viability of these tests, too. These two tests have been mentioned in Chapter V. Table 6.2 shows the summary of the scores obtained by the 12 subjects.

The greatest variance was in haptic sensitivity though the range was more in spatio-motor ability. Thus, there were some who could replace 10 blocks in just a minute while others took around three minutes. While tracing the star pattern many got stuck in a groove
and did not know how to come out. Hence, the score was as high as 162 S. With a few, such a problem did not occur. They somehow found the way. One subject took just a little more than half a minute on the average of six trials to complete the star pattern.

Table 6.2 Summary Statistics of the Pilot Study

<table>
<thead>
<tr>
<th>Statistics</th>
<th>EOCV</th>
<th>Intero Sensitivity</th>
<th>Spatio-motor Ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>23.67</td>
<td>121.08 S</td>
<td>112.83 S</td>
</tr>
<tr>
<td>S.D.</td>
<td>1.90</td>
<td>30.68 S</td>
<td>30.25 S</td>
</tr>
<tr>
<td>Maximum</td>
<td>26</td>
<td>173 S</td>
<td>102 S</td>
</tr>
<tr>
<td>Minimum</td>
<td>21</td>
<td>62 S</td>
<td>34 S</td>
</tr>
<tr>
<td>Range</td>
<td>5</td>
<td>111 S</td>
<td>128 S</td>
</tr>
</tbody>
</table>

With regard to EOCV, there was no significant variability. Most of the subjects scored around chance, that is 24. The chance score indicated several other things: the subjects were not receiving auditory cues; they were not able to peep and find out the stimulus; and they merely guessed the number.

Nevertheless, their introspective reports indicated that some of the subjects felt the change but were not sure of the difference between 1 and 2. The major complaint was that they felt the change once in a while and that too, quite weakly.

This convinced the researcher about the veracity of the measurement technique. If one is really sensitive to EOCV, one can score very much above chance, in spite of the intermittent, weak, and unstable stimulation.

It is to unravel such capability in human beings that the present study has been devised. If some subjects do have sensitivity for EOCV, what makes them different from the others? Gaining an insight into the variability they possess in terms of other variables is quite essential as a first step toward the exploration of human sensitivity.