CHAPTER III

THE METHODOLOGY

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3.0 Introduction

Scientific research depends to a large extent upon the nature and kind of methodological sophistication that the investigator employs in his investigation. Keeping in view, the vast advancement in sampling techniques, research tools, control of variables and field-experiment designs, it becomes essential to employ the recent trends in the measurement of the variables under-study; however, the relevance of the findings depends not only upon the application of the methodological sophistication, but ultimately upon the objectivity, dependability and relevance of the sampling techniques employed, instruments used, methods and procedures followed and controls and precautions observed in the application and use of variables. This chapter designs the methodology employed in this study under the captions of: (A) sampling techniques followed, (B) Instruments used, and (C) Methods and Procedures adopted.
3.1 Sampling Technique:

3.11 The Rationale of the Universe Selected

The investigation has been designed to study the psychological stress as related to achievement motivation and educational and occupational aspiration of pupil population studying at the terminal grades of the secondary schools and post-graduate courses of Raipur City. The universe of study, therefore, was located at the terminal grade educational institutions of secondary schools and post-graduate departments of the Ravishankar University and Colleges.

The terminal grades of these two educational levels, (i.e. the secondary school and post-graduate) were selected on the grounds that most of the students pursuing their education at these grades, are very conscious about the selection and placement of their jobs as their immediate life goals. Such a temperament is also consciously operative even at the final graduate level; but we have deliberately deleted it on the grounds of the multiplex characteristics and huge size of the pupil population. Further, it is too difficult to control the nature and kind of vocational variables at this terminal grade. At the post-graduate level, the vocationalization is rather more saturated and greater crystalized. At the terminal grade
of secondary school, it is, rather, in a very fluid state of conscious operation.

With a view to study the level of difference in the vocational aspiration of these two terminal grades of the educational ladder (i.e. secondary school and post-graduate); the graduate level as a terminate grade was deleted. The selection of pupil-samples from these two terminal grades made possible not only the amount of difference in the vocational aspiration of pupils studying at these two extreme terminal grades, but also the nature and kind of psychological stress that the pupils of two different terminal grades as specified above may display. The study has, therefore, been conducted over the representative pupils of the two terminal grades of the secondary schools and post-graduate level of Raipur city. The universe of study is, thus, located at the terminal grade (i.e. class XI) of higher secondary schools of Raipur city, and the post-graduate departments of colleges and University Teaching Departments of Ravishankar University, Raipur.

3.12 The Sample: Size and Technique

Raipur is the divisional head-quarter as well as the chief commercial, cultural and educational centre of the Chhattisgarh region of Madhya Pradesh. It is located on the Bombay–Howrah railway track, and is about 28 Kms
away, to the east of Bhilai Steel Plant. Consequently, it is an emerging industrial centre of the Chhattisgarh region. With a view to meet the great needs and demands of the people living in and around Raipur, almost all kinds of educational institutions have emerged within the last twenty years. It has witnessed tremendous growth in the recent years. The Ravishankar University was founded at Raipur in 1965. Since its inception, a number of postgraduate departments imparting education in different disciplines have been started. For a global view, the educational university of this study with Raipur as central place in Raipur District is presented below:

<table>
<thead>
<tr>
<th>Educational Institutions</th>
<th>Boys</th>
<th>Girls</th>
<th>Coed.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preprimary schools</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>2. Primary</td>
<td>49</td>
<td>47</td>
<td>-</td>
<td>96</td>
</tr>
<tr>
<td>3. Middle Schools</td>
<td>11</td>
<td>6</td>
<td>-</td>
<td>17</td>
</tr>
<tr>
<td>4. Higher Sec. Schools</td>
<td>19</td>
<td>8</td>
<td>- 2</td>
<td>27</td>
</tr>
<tr>
<td>5. Public School</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>6. Blind School</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>7. Sanskrit Pathsala</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>8. B.T.Is</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>10. Colleges-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Arts, Commerce &amp; Home Science</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>(b) Science</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>(c) Medical</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(d) Engineering</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>(e) Agriculture</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>(f) Ayurvedic</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(g) Homeopathic</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(h) Law Colleges</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>(i) Sanskrit</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(j) Education</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(k) Music</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11. University: Post-graduate teaching</td>
<td></td>
<td></td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>University: Post-graduate teaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universities &amp; Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The universe for this study comprises of pupils from the higher secondary schools and post-graduate departments in natural sciences, social sciences and humanities taught in the post-graduate colleges or university teaching departments.
For drawing out a testable size of sample, the universe of pupil population at terminal grades of was defined as specified in terms of (i) schools/departments/disciplines, (ii) nature of stratification of schools and (iii) size of sample pupils to be drawn out from each of the final grades and strata of schools/college/university teaching departments.

In view of the fact, that post-graduate studies are restricted only to certain colleges, as well as in the university teaching departments, all such colleges and University Teaching Departments were selected for the study purposes; however, only selected disciplines were retained. Having adopted the purposive sampling technique, a few disciplines taught in these post-graduate departments of the colleges or university were selected; and 100% pupils were drawn out for the study, since population in these disciplines were quite restricted and small. The specification of the post-graduate samples from final grade of M.A., M.Sc. or M.Com. drawn out for the study has been presented below in a tabular form.
<table>
<thead>
<tr>
<th>S.No.</th>
<th>College/University</th>
<th>Broad field of discipline</th>
<th>Specific discipline</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>UTD of Mathematics</td>
<td>Natural Sciences</td>
<td>Mathematics</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>RS Univ., Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Govt. Science Coll.</td>
<td>, ,</td>
<td>Chemistry</td>
<td>13</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Govt. Girls College</td>
<td>, ,</td>
<td>Chemistry</td>
<td>-</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Govt. Science Coll.</td>
<td>, ,</td>
<td>Zoology</td>
<td>9</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Govt. Science Coll.</td>
<td>, ,</td>
<td>Botany</td>
<td>8</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Govt Girls College</td>
<td>, ,</td>
<td>Botany</td>
<td>-</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(a) Total:</td>
<td></td>
<td></td>
<td>37</td>
<td>25</td>
<td>62</td>
</tr>
<tr>
<td>7.</td>
<td>UTD, RSU, Raipur</td>
<td>Social Sciences</td>
<td>Psychology</td>
<td>9</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>8.</td>
<td>UTD, RSU, Raipur</td>
<td>, ,</td>
<td>Geography</td>
<td>17</td>
<td>13</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>College, Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>UTD, Raipur</td>
<td>, ,</td>
<td>Sociology</td>
<td>16</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>11.</td>
<td>Durga Arts &amp; Com.</td>
<td>, ,</td>
<td>Economics</td>
<td>63</td>
<td>0</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>College, Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) Total:</td>
<td></td>
<td></td>
<td>123</td>
<td>40</td>
<td>163</td>
</tr>
<tr>
<td></td>
<td>College, Raipur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) Total:</td>
<td></td>
<td></td>
<td>85</td>
<td>-</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>Grand total:</td>
<td></td>
<td></td>
<td>245</td>
<td>65</td>
<td>310</td>
</tr>
</tbody>
</table>
These final grade post-graduate sample pupils have been employed to study the cross-sectional differences in (a) the amount of psychological stress, (b) their level of educational and vocational aspirations, and (c) their achievement motivation in comparison to the final grade secondary school sample pupils. This sample has been purposefully designed with a view to estimate the direction and magnitude of change in the above psychological variables.

A variation in the sampling technique was employed keeping in view the size of higher secondary schools, and the pupils studying in the final grades. The universe of final grade (i.e. class XI) of the higher secondary schools, in Raipur city comprised of 27 schools, out of which 19 are boys and 8 girls. There were about 3679 pupils studying as regular students of the eleventh class of the higher secondary schools in Raipur city.

Keeping in view the nature and size of pupil population studying in final grade of higher secondary schools of Raipur, a random sampling technique was employed to draw out representative schools as well as representative pupils from the universe. In view of the fact that the sample should represent both the sexes and all the streams of studies, all the schools were first of all stratified in terms of sex, and then in terms of streams of studies.
They were sequentially, systematically catalogued alphabetically keeping in view the sex and streams of studies and about 1/10 of the sample pupils and about 45% of sample schools were drawn out by employing randomized stratified quota sampling technique. Every second school from the list classified in terms of sex was selected; the total number of boys schools being 9 and girls 3. A quota was fixed for drawing out sample pupils from each of these 12 schools in proportion to the distribution of universe in terms of sex. Randomization was done by drawing out sample pupils from each school; however, stratified quota sampling was also observed at the same time. About 30 pupils from each of these 12 schools from a single section or a single stream were randomly drawn out. In all 370 pupils which constitute about 1/10 of the pupil population of the universe under-study in proportion of their distribution according to sex were drawn out. The detailed specification of the size and nature of sample is given below;
TABLE - 3.1 Size and Nature of Sample Pupils drawn out from Higher Secondary Schools Terminal Grade

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of School</th>
<th>Stream of study</th>
<th>SEX</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Govt. H.S. School</td>
<td>Commerce</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>2.</td>
<td>M.R. Sapre H.S. School</td>
<td>Arts</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>3.</td>
<td>B.P. Pujari H.S. School</td>
<td>Arts</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>5.</td>
<td>R.D. Tiwari H.S. School</td>
<td>Arts</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>6.</td>
<td>Rashtriya H.S. School</td>
<td>Arts</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>7.</td>
<td>Shaheed Smarak H.S. School</td>
<td>Science</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>8.</td>
<td>Khalsa H.S. School</td>
<td>Arts</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>9.</td>
<td>Gujarati H.S. School</td>
<td>Arts</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>11.</td>
<td>Salem H.S. School</td>
<td>Science</td>
<td>-</td>
<td>55</td>
</tr>
<tr>
<td>12.</td>
<td>Govt. Girls HS School, Katora Talab</td>
<td>Arts</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td></td>
<td>254</td>
<td>116</td>
</tr>
</tbody>
</table>
The size of sample pupils drawn in terms of sex for the study observes the proportion of distribution of sex in the universe, as exhibited in the table given below:

**TABLE - 3.2** Distribution of pupils in accordance with sex

<table>
<thead>
<tr>
<th>Universe</th>
<th>Sample Drawn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>N</td>
<td>2537</td>
</tr>
<tr>
<td>Proportion</td>
<td>2.13 : 1</td>
</tr>
</tbody>
</table>

The study was, thus, conducted on 370 representative pupils randomly drawn out from the final grade of the representative higher secondary schools of Raipur city by employing stratified quota sampling technique; however, 310 pupils from post-graduate classes were drawn out from the available disciplines in the colleges and Ravishankar University Teaching Departments on the criterion of 100% representativeness by employing purposive sampling technique.
3.2 **Instruments:**

Selection of a scientific instrument is an essential condition for setting valid findings. Since psychological tests or measures are relative in nature, it becomes necessary for the researcher to screen the materials scientifically with a view to use only dependable instruments. The availability and suitability of an instrument, therefore, became essential consideration in the application and use of a certain instrument for the research under-study. In the absence of objective, reliable and valid instruments, the researcher has to develop or adapt some instruments so as to suit the need of the investigation.

Keeping in view the hypotheses formulated earlier which have been put to test in this study, the following instruments have been carefully selected, and have been scientifically employed.
<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Achievement motivation Inventory by Prayag Mehta.</td>
<td>Parameters of Psychological stress measured by:</td>
</tr>
<tr>
<td>(ii) Educational Aspiration Scale by V.P. Sharma and Ku. Anuradha Gupta.</td>
<td>I Negatively Toned Affects by:</td>
</tr>
<tr>
<td>(iii) Vocational Aspiration Scale by J.S. Grewal.</td>
<td>(i) Frustration test by N.S. Chauhan and G.P. Tiwari</td>
</tr>
<tr>
<td></td>
<td>(ii) Sinha's Comprehensive Anxiety Scale by A.K.P. Sinha and L.N.K. Sinha</td>
</tr>
<tr>
<td></td>
<td>II Motor Behaviour Reaction Scale constructed by the Investigator herself.</td>
</tr>
<tr>
<td></td>
<td>III Electro-physiological measures indicated by -</td>
</tr>
<tr>
<td></td>
<td>(i) EEG</td>
</tr>
<tr>
<td></td>
<td>(ii) EKG and</td>
</tr>
<tr>
<td></td>
<td>(iii) EMG</td>
</tr>
</tbody>
</table>
The concept, the rationale of selection and the description of the selected tools constitute the content of this caption of chapter III.

3.21: **Instruments Employed to Measure Independent Variables:**

3.211 Measuring Achievement Motivation:

(a) **The Concept:**

Murray's (1938) TAT type pictures have been invariably adapted for a long time by the pioneering researchers (McClelland et al., 1953, 1960, 1963; Atkinson, 1958; Heckhausen, 1963, etc.). The original scoring key was developed by McClelland et al. (1953) who first scored the stories written in response to the TAT type picture for achievement imagery on any one of the three criteria:

1. *Success in competition with some standard of excellence,*
2. *Unique accomplishment,* and

In each of the components of \( n \text{ Ach, namely, Need (N); Instrumental Activities (I); Goal Anticipation (Ga + and Ga-); Blocks (Bw and Bp); Help (H); Emotions (G+ and G-); and Achievement Thema (Ach Th), the level of achievement motivation have been examined.*
(b) Rationale for the Selection of AMI by Prayag Mehta:

The projective techniques have been, no doubt, indiscriminately employed for measuring n Ach by the researchers, but they lack in specificity, objectivity, reliability and validity because of their astructured ambiguous stimulus characteristics. To meet this problem of scientific measurement, objective measure of n Ach has been developed by Prayag Mehta (1969) under Indian conditions. Since economic status (McClelland, 1961), social approval (Atkinson et al., 1962), Social Class (Feld, 1960, McClelland, 1955; Rosen, 1956; Veroff et al., 1960), adolescents' culture, social acceptance (Ryan, 1958; Tannanbaum, 1962; Fraser, 1959; Coleman, 1960) and other socio-cultural dimensions of a culture or a community are potential determinants of n Ach, it was decided to use the Achievement Motivation Inventory (AMI) of Prayag Mehta (1969) which provides an objective measure of n Ach.

For measuring the n Ach of the Ss, the AMI of Prayag Mehta has been selected on the following rationale:

1. This AMI is an objective measure of achievement motivation developed under Indian culture and
conditions which are significant variables of \( n \) Ach.

2. The AMI has been validated against the Murray's (1938) TAT type pictures; and thus, it is a dependable as well as a valid instrument.

3. From the point of view of administration, it is more economical in term of time and energy; and can be easily administered because of its being self administered inventory.

4. It does not present a language barrier for the Ss; and therefore, can be conveniently administered over the sample under-study.

5. It is the only objective reliable and valid test available for the measurement of \( n \) Ach in India, most convenient in administration and easily available; and therefore, its selection and application was valid on an a-priori ground.

6. It is meant for the age-group which has been taken-up for the present study; and the norms prepared over the normative sample of standardization, enhance its meaningfulness in interpretation, and dependability and validity in selection.
(c) Description of AI/I:

The AI/I of Prayag Mehta (1969) is an objective measure in Hindi of estimating the _n Ach_ of Indian youth. The inventory contains 22 descriptive statements of pictorial stimuli which were tried out in connection with the development of the thematic apperceptive measure of _n Ach_. In each of these 22 items, there are six alternatives of which the Ss are required to check one. Two, each of these six response options, are achievement-related (AR), task-related (TR), and unrelated to achievement (UR). The response options for these twenty-two items have been selected from the pupil's responses of the pictorial cues stories to about 50 TAT type pictures after having coded them as either achievement-related imagery (AI), task-related (TI) or unrelated (UI). The six selected pictures out of 50 pictures cues showed satisfactory discrimination and evokability for achievement imagery. These pictures contain culture-bound cues familiar to the normative sample.

The AI/I provides four scores - AR, TR, UR and AMI. Any one response can be either AR, TR, or UR. The AR, TR and UR scores of each testee are counted on the strength of the nature of the response. The total AMI score is obtained by deducting the total UR scores from AR scores.
The AMI has been standardized over 4,000 male pupils of grade IX of Delhi schools. It is a self-administered inventory that takes about 20 minutes to complete all the items. The norms have been developed with respect to schools' achieving status and socio-economic status. The number of AR ranged between 2 and 20 and the TR and UR from 0 to 14. Each testee gave 22 responses to 22 AMI items of which about 50% were AR with mean AR at 11.40; and the TR and UR responses together constituted the remaining 50%. The AMI designer is silent on the processing system of negative scores. In the present study, all negative scores have been reduced to zero.

This AMI, developed on the basis of the TAT type pictorial cues and stories written to them provides two distinct measures on: (1) An achievement related motive, similar to test anxiety (Mandler and Sarason, 1952; Sarason et al., 1958-b; Atkinson and Litwin, 1959) or the motive to avoid failure \( M_{AP} \); and (2) Achievement related values. The two showed negative correlations with \( \eta_{Ach} \), total school performance and self-expected vocational success, whereas the total score on AMI and AR showed positive correlations with all these three external criteria of validation. This high confidence attached to the validity of the AMI ensures its high index of reliability; since if a psychological instrument is valid, it ought to have dependability by logical rationale.
3.212 Measuring Educational Aspiration:

(a) The Concept:

'Level of Aspiration' is a psychological construct which reflects a cognitive type of motivation of the individual. Frank (1949) defines it in terms of the level of future performance in a familiar task which an individual knowing his level of past performance in that task explicitly undertakes to reach. James Drever (1948) explains it as a frame of reference involving self-estees or alternatively as a standard with reference to which an individual experiences, i.e. has the feeling of success or failure. Thus, the term level of Aspiration involves the estimation of his ability (whether over, under or realistic) for his future performance on the strength of his past experience (goal discrepancy), his ability and capacity, the efforts that he can make towards attaining the goal, thus set by him. The goal setting behaviour as well as the process of attaining the goal are consequences of his past experience, whether failure-oriented or success-oriented, level of efforts made by him in that direction, and his capacity to pursue the goal. In the process of setting the goal, keeping his view his level of ability and potentiality on the strength of his past experience, an individual identifies his ability or compares his potentiality with the external criteria or standard; the norms and
values of which stand as a frame of reference. When he tries to attain the goal, he, thereby, makes efforts to attain the excellence needed for the reference group or referred objects. Thus, level of aspiration indirectly refers to the process of attainment of the established norms and values of the reference group which stands as a goal for the individual. Such an interpretation of the level of aspiration takes into consideration four main points which could be distinguished in a typical sequence of events.

(i) Last performance or past experience;
(ii) Setting of level of aspiration for the next performance;
(iii) New performance, and
(iv) Psychological reaction to the new performance.

The difference between the level of the last performance and that of the new goal is called 'Goal Discrepancy' whereas the difference between the goal level and that of the new performance, is called 'Attainment Discrepancy'. The greater the discrepancy, whether goal or attainment, the lesser the changes of attaining the goal and the wider the frustration that the individual may experience. Thus, neither the over-estimation nor the under-estimation, whatsoever they may be, but it is the realistic estimation in terms of least goal or attainment.
discrepancy that brings home the highest level of satisfaction ascertaining his reality oriented personality; and consistency between his goal setting behaviour and his ability and efforts to attain the same.

Hoppe (1930), Dembo (1931, 1944), Escalona (1940), Festinger (1942), Lewin K. (1944), Sears (1944), Parikh and Chattopadhyay (1965), Prabharamalinga Swami and Sharma (1970), Shah and Dhargawa (1972), D. Sinha (1972), H. Singh and Tiwari (1973), B.P. Bhargawa (1974) and Greval (1975) and Sharma V.P. and Gupta, A. (1979) have used different instruments to measure different kinds of level of aspiration of different samples. The materials used in measuring level of aspiration varies from very simple (e.g. cancelling or writing letters and digits) to very complex (e.g. using standardized scales).

A review of literature on the measurement of educational aspiration reveals that in most of the cases the level of educational aspiration has been estimated from their aspiration of passing through a certain level of academic courses, or attaining a certain certificates, diploma or degree (H.D. Lakshminarayana, 1972, W.H. Sewel et al., 1954, 47-60; B.C. Kuthayya, 1972, S.F. Jain, 1969; Shah, V.F. et al., 1971, Sewell, W.H. et al., 1956, S.P. Jain and J.P. Shah, 1974 etc.). For the first time, late (1972) constructed a small scale for measuring the
level of educational aspiration. However, an objective scale for measuring the level of educational aspiration was developed and standardized for the first time by Sharma, V.P. and Gupta, A. (1979). They standardized two forms of the Educational aspiration scale: Form V and Form P, the former could be used only for college students whereas the latter form P could be employed for any literate sample.

(b) Rationale for standardizing an Educational Aspiration Scale:

In view of the fact that no educational aspiration scale was available for measuring the level of educational aspiration, the investigator under the co-authorship of her guide developed and standardized an Educational Aspiration Scale, Form P over the sample under-study.

(1) The Educational Aspiration Scale, Form P.

The Educational Aspiration Scale (EAS), form P, constructed and standardized by Sharma, V.P. and Gupta, A (1979) is an objective measure of the level of educational aspiration of pupils regardless of any grade or age. The scale was developed keeping in view the level of understanding, educational maturity and growth pattern of pupils.
(ii) **Rationale for Developing the Scale:**

This scale has been developed on the rationale that: (i) past experience (Pe) in terms of marks obtained, estimate or goal set, success of failure experiences (ii) amount of efforts (Ae) made in the examination, and (iii) ability and capacity (Ac) to study for the examination have a direct bearing upon setting a future goal. More specifically, it could be stated that:

$$EAS = f(Pe \times Ae \times Ac)$$

With such a sequence, there are four main points in a level of aspiration situation (Lewin, K., Dembo, F., Festinger, L. and Sears, P.S. 1944).

**Typical Type Sequence**

<table>
<thead>
<tr>
<th>Last performance</th>
<th>Setting of level</th>
<th>New performance</th>
<th>Reaction to performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Discrepancy</td>
<td>Attainment Discrepancy</td>
<td>Feeling of success or failure related to difference of level 2 and 3.</td>
<td></td>
</tr>
</tbody>
</table>
Thus, the analysis of scores on EAS could give us (i) Goal discrepancy scores, (ii) Attainment discrepancy scores, and (iii) feeling and direction. Goal discrepancy or attainment discrepancy in terms of over or under estimation would make the individual feel about his level of dissatisfaction or nature of orientedness from the point of view of level of aspiration in relation with efforts made or ability possessed.

(iii) The Description:

The EAS, Form P has been developed by taking into consideration the above variables operating in the past and present so far as setting the level of educational aspiration in future is concerned. Paired comparison technique has been employed. By resolving these primary variables into different factors which could be effective in the past, present and future, 45 items designed in a paired comparison form have been developed. These items have been refined several times from the point of view of the phraseology, structure and presentation.

EAS could be administered in group situation. It is a self-explanatory scale; however, the tester should establish proper rapport before administering it. There is no time limit, however, it takes about 25 minutes to administer the whole scale. The instruction for adminis-
tration is given in the test booklet. Two category responses by a way of selecting one over the other by paired comparison method have been permitted. The response is, therefore, scored as 1 or 0. The obtained scores may range between 45 and 0. The total score determines the standing on the scale of the individual.

The coefficient of stability computed by Test-Retest method has been estimated to be $r_{tt} = .98$ whereas the coefficient of internal consistency estimated by odd-even technique using S.B. formula has been found to be $.803$. The EAS, Form P, has been validated against the external Scholastic Performance and Form V of EAS which have been estimated to be $r = .692$ and $r = .596$ respectively. Percentile norms and classification of raw scores into different levels of educational aspiration have been worked out with a view to draw out meaningful interpretations and valid inferences from the data at hand.

3.213 Measuring Occupational Aspiration:

(a) The Concept:

Level of occupational aspiration (LOA) has been defined as orientation towards occupational goal (Haller & Miller, 1963). The LOA is considered as a concept which is logically a special instance of the concept of level of aspiration. 'Specificity' in occupational orientation is
the core of the level of aspiration. Its special nature consists of only in the continuum of difficulty which determines the hierarchical nature of level of occupational aspiration.

Keeping in view the 'specificity' in the measurement of occupational aspiration, Haller and Miller (1967) developed a scale for measuring level of occupational aspiration, popularly known as 'Occupational Aspiration Scale' (OAS). They utilized the list of 90 representative occupations of the National Opinion Research Centre (NORC, 1947) of the U.S.A. to prepare this OAS which consists of eight multiple-choice type items. Each item contains ten occupations nearly of all occupational status level arranged in a mixed order. The OAS asks for both short and long range realistic as well as idealistic expressions of the level of occupational preference. Each of these four contributions are assessed twice, thereby making the number of items to eight.

J.S. Grewal (1975) adapted Haller and Miller's OAS under Indian conditions; and prepared norms for it.

In view of the fact that occupational aspiration measures a very specific aspect of behaviour, the content validity as well as the construct validity of the behavioural measurement must take into consideration the concept
of occupational aspiration specified above. No other
tests, except the two mentioned above, were available for
measuring occupational aspiration.

(b) **The Rationale of Selection of OAS:**

The Occupational Aspiration Scale (OAS) Adapted
and standardized by J.S. Grewal (1975) under Indian
conditions has been employed in this study on the grounds
that:

(i) It was the only scale available under Indian
conditions for measuring occupational aspiration.

(ii) In view of its Indian adaptation, it certainly
suited better than Haller and Miller's OAS (1947).

(iii) Even from the points of its administration, it
is easy to administer even in a group situation, easy in
understanding and is well within the mental ability of the
sample under-study in terms of language and technique.

(iv) It provides Indian norms which make the inter-
pretation more meaningful and vivid.

The description of this OAS (J.S. Grewal, 1975)
is as under:
(c) The Description of OAS:

The OAS adapted and standardized under Indian conditions by J.S. Grewal (1975) after Haller and Miller's (1947) occupational aspiration scale has been used in this study with the primary aim of measuring the level of occupational aspiration of the samples under-study.

The OAS was adapted by getting the prestige rating of 150 occupational titles, identical with the NORC list. These titles were taken from the Dictionary of Occupational Titles of India. A panel of judges employed in different occupations rated these 150 occupational titles, and eliminated some retaining thereby 108. These 108 occupational titles were given to 200 persons with the instruction that they have to rate each occupation on a five point scale ranging from an occupation of 'excellent' to 'poor' standing. Social standing of each occupation was calculated out of a rank of 100 multiplying frequency ratings in each of the five categories by 1.0, 0.8, 0.6, 0.4, 0.2 respectively. Thus all '0' to '9' depending upon their ranks which ranged from '20' to '95' and above, were retained. Eight out of 108 occupations with different prestige values were arranged in mixed order in eight multiple choice items. Each item contains ten occupations arranged in a mixed order of their prestige value. The OAS measure both short and long range realistic as well as
idealistic expressions of the level of occupational preferences. Each of these four combinations are assessed twice, thereby making the number of items to eight.

The occupational titles for each item have been used only once in the scale. Responses were scored with the help of hand scoring key. The score of each item ranges from 0 (lowest) to 9 (highest). A score of '9' indicates that a job from among the highest eight prestige occupations has been preferred, and a score of '0' indicates that one of the lowest eight occupations has been preferred. An individual's score for the whole inventory ranges between 9 and 72.

It is a 'self-explanatory' inventory that takes about half an hour to take the whole test. The coefficient of stability as determined by test-retest method was found to be 0.8+ whereas the coefficient of internal consistency between the two halves (A half items 1, 2, 5 and 6; B half: Items 3, 4, 7 and 8) was estimated to be 0.5+. The OAS has been validated against Haller and Miller's (1947) Occupational Aspiration Scale, and the co-efficient of validity was found to be 0.75. Percentile norms with respect to age and grade have been developed.
3.22 **Instruments employed to measure Dependent variables:**

Psychological stress as a dependent variable of this study has been operationally defined in terms of total scores obtained by an individual on its various parameters. Lazarus R.S. (1966, p. 319) considers four classes of response variables of psychological stress:

1. Negative-toned affects.
3. Alterations of adaptive functioning, and
4. Physiological indicators.

A functional analysis of these response variables reveals that the strength of the stress responses is determined by the strength of the intervening process, that is by the degree of threat; the quality of the response depends on the type of coping process: (Lazarus, 1966, p. 319). Thus the degree of threat and nature of coping process are reflected through the response variables of stress. The two can hardly be separated.

Spence (1958), Sarason and Mandler (1952), Korchin (1962), Easterbrook (1959) and others have remarked that the adapting functioning under psychological stress is governed by the coping process of the stress. Lazarus,
Deese and Osler (1952), Lazarus and Baker (1964), Lazarus and Speisman (1960) are of the opinion that the relation between experimental conditions of threat and performance cannot be understood adequately without taking into account the antecedents of threat and the process of coping that intervene between threat and reaction. Since the investigation does not aim at studying the coping process as a defense mechanism of psychological stress, the alteration of adaptive functioning as an indicator of psychological stress has been excluded from study. No data, therefore, have been collected on this aspect of measuring the psychological stress.

Out of the rest of the response variables of stress i.e. (1) Negative-toned affects, (2) Motor behaviour reactions, and (3) Electro-physiological indicators, the following parameters (Lazarus, R.S., 1966, p. 319) have been selected for their inclusion in this study as measures of stress reactions on the rationale of their significance, feasibility, convenience and essentiality.

I. Negative-toned Affects:
   (A) Frustration
   (B) Anxiety

II. Motor Behaviour:

III. Three electro-physiological measures:

(A) EEG
(B) EKG
(C) EMG

Psychological instruments were selected for measuring these parameters of stress on the strength of their specificity. The rationale of selection and a brief description of these instruments are presented below :-

3.221 Measurement of Negative toned Affects:

The degree of negative toned affect is response indexing degree of threat and could be measured by such instruments as are indicative of negative emotional expressions. Anxiety Scales by Taylor (1953), Casteneda, Ho Candles, and Palermo (1956), Sandig (1956), Cattell and Scheier (1960), Dixon, DeMonchaux and Sandler (1957), Endler, Hunt and Rosenstein (1962), Freeman (1953), Lykken (1957), Martin (1961), Perlman (1958), Sarason, Davidson, Lighthall and Maite, (1958), Sarason and Mandler (1952), Welsh (1952, 1956), Sinha D. (1960), Sinha and Sinha (1975), and many others have measured various forms of anxiety by their instruments as negative toned affect whereas the Depression Scales of Brackbill, Little (1954), Deese, Lazarus and Cannon (1953), Erikson and Davids (1955),
Hargreaves, W.A., Starkweather, J.A., Blacker, (1965) and frustration scales of Rosensweig (1945), Udai Pareek (1958, 1959, 1960, 1965, 1966, 1968), Chauhan and Tiwari (1972) and such other scales have been used as the measures of the negative toned Affects. In this study, frustration and anxiety have been selected as negative toned affects measuring psychological stress. They have been measured by employing suitable instruments as presented below:–

3.221 Measurement of Frustration:

(a) The Concept:

Frustration has been defined as a hypothetical construct produced either by some type of inhibitory condition, or by a competitive excitatory tendency aroused simultaneously by an already enjoying excitatory tendency to strength (Brown and Farber, 1951). Emotion is the core to frustration (Sargent, 1948). Since frustration behaviour lacks goal orientation and is the end of need deprivation, the strength of the inhibitory tendency varies as a function of response-blocking amount of work or non-reward (Chauhan and Tiwari, 1972). Frustration has been studied in a variety of ways. Some investigators have studied it as a motivational determinant (Amsel and Roussel, 1952; Brown and Farber, 1957; Parney, 1960; Bower, 1962), some as an inhibitor (Brown and Farber, 1951; Estes, 1958) of horn
trouting responses (Doob and Gross, 1968), some as a primary motivational condition aroused by cessation of reward (Estes, 1958; Amsel, 1958) while some others as emotionally toned phenomenon (Sargent, 1948).

Studies in frustration (Amsell and Roussel, 1952) obtained 'frustration effect' which has been defined as the difference between the vigour of performance following reward as contrasted with non-reward. Max (1956) observed an 'association' phenomenon in frustration. It was held that the organism had simply learned to make a more vigorous response under the conditions of frustration. The affective arousal as fundamental in the definition of stress supported Sargent's contention of considering emotion as core to frustration.

These concepts of frustration get expression through aggression, fixation, regression and resignation.

(1) Aggression:

Aggression has been defined as 'an act whose goal response is injury to an organism or organism-surrogate': (Dollard, et al., 1939, p. 11). It is the result of frustration (Weller and Suleman, 1968; Hollenberg and Sperry, 1951; Sears, Rober, s. 1951). However aggression has been operationally defined in terms of the total score obtained by an
individual on items that describe a behaviour characterised by rude answering to elders, irritation, feeling of unfairness, carrying grudges, frequent quarreling, broken engagements, impulses to take revenges and reactionary attitudes to tradition and beliefs (Chauhan and Tiwari, 1972).

(ii) **Fixation:**

Symonds (1946) considers 'Fixation' as a defense against anxiety by stopping the process of development. Fixated behaviour as such remains compulsive (Maier, 1949). It has been observed that in fixation, re-occurrence of behaviour takes place without variation in its nature and kind, and there appears a degree of resistance to change. Fixation obstructs the inflow of information and presents psychological blocks in forming new associations, developing new interests and getting new adaptations. It may be the result of either over gratification or frustration of the normal expression of instinctual drive. However, fixation has been operationally defined in terms of the total scores obtained by an individual on items describing a behaviour characterised by cherishing for deep and lasting hurts, persistence of childhood fears, worries of hypoweight, feeling of physically handicapped, feeling of negligence etc. (Chauhan and Tiwari, 1972).
(iii) Regression:

Regression refers to retreat, a returning to an earlier mode of adjustment, thought, feeling and behaviour (Symonds, 1946) with the hope of getting some relief out of present frustrative situations. In their 'Frustration-Regression Hypothesis', Barker, Dembo, Lewin and Wright (1941) considered regression as the end response of frustration'. Operationally, regression may be defined in terms of the total scores obtained by an individual on items describing a behaviour characterized by bashfulness, finicky about foods, feels lacking in self-control, wish to be again escapist, homesick when away from home, cries easily, speech defective, excessive day dreams, exorbitantly, ambitious etc. (Chauhan and Tiwari, 1972).

(iv) Resignation:

Resignation has been characterised by an emotionally tinged attitude shown by cessation of active response to a situation which we have previously been making efforts to alter. Zawadski and Lazaresfeld (1935) obtained extreme elimination of needs, no plans, no definite relations to the future, either no hopes at all or hopes which are not taken seriously. Resignation has been operationally defined in terms of the total scores obtained by an individual on
items that describe a behaviour characterized by limitation of all needs, no plans, no definite relations to future, withdrawal from social contacts, frequent and serious consideration of committing suicide, longing for loneliness, retreatism, returning with one's self, lacks interest in surroundings etc. (Chauhan and Tiwari, 1972).

In essence, aggression is the expression of hostile frustration, regression is a condition of fixation, fixation is a defense against anxiety by withholding the process of development; whereas resignation is the extreme of withdrawal from reality. Thus, a global psychological construct of frustration takes into consideration all these four modes of expression of frustration; aggression, fixation, regression and resignation. Hence, frustration has been operationally defined, in this study, as a total score obtained by an individual on all the items of a frustration scale characterised by emotionally tinged behaviour (Sargent, 1948) which being the mode of expression of aggression or fixation or regression or resignation.

(b) The Rationale:

Numerous studies on frustration have been conducted as a part of personality dynamics. Projective techniques using TAT and Ink Blot Tests have been invariably employed as measures of frustration. However, no specific test on
frustration was available till Rosenweig (1945) published his first projective test entitled as 'The Picture Frustration Test'. Rosenweig's Picture Frustration (PF) Test was subsequently adapted for children, and later on for adults under Indian conditions (Pareek, Uda, 1958, 1959, 1960, 1965, 1966, 1968). Shrivastava, S.P. (1953) and Muthayya, B.C. (1961, 1962) also developed other picture frustration tests with a view to meet the research and other needs in India. However, all these PF Tests being developed on the models of Projective technique, limitations and shortcomings that we observe in a projective technique were inherent there. Greater amount of subjectivity and unreliability and time-consuming process of coding and analysis challenged the validity and frequent application of the picture frustration test as a projective technique. Consequently, some objective tests measuring frustration were looked for. Dollard (1943) and Shaffer (1947) made use of the questionnaire method to study frustration. This was rather an attempt to objectify the scoring to a certain extent. Indian adaptation of Rosenweig's Picture Frustration Test for children and adults did not serve the purpose because of its being Projective technique.

The only objective test available for measuring frustration under Indian conditions was the 'Frustration Test' standardized by Chauban and Tiwari (1972). This
measure was prepared and standardized in the line with Dollard's (1943) and Shaffer's (1947) questionnaire method and made use of ratings for ten items of each of the four modes of frustration. It studies effects of frustration upon the quality of a person's behaviour as a whole.

This 'Frustration Test' developed and standardized by Chauhan and Tiwari (1972) has been employed in this study for measuring frustration on the strength of (i) its availability, convenience and suitability under Indian conditions, (ii) its high degree of objectivity, reliability and validity, (iii) its greater applicability in terms of measuring all the four dimensions of frustration, as well as its being a global measure of frustration, (iv) its easy scoring, and language facility; and (v) its non-time-consuming processing, and objective analysis of responses.

The description of the 'Frustration Test' has been presented below:

(c) The Description:

The 'Frustration Test' standardized by Chauhan and Tiwari (1972) is an objective measure of frustration. It measures the four modes of expression of frustration, i.e. aggression, fixation, regression and resignation.
The scale consists of 40 items out of which each of the four modes of frustration has 10 items. Each test item describes certain behavioural unit of frustration that occurs in daily life. The test items describing different modes of frustration have been presented below:

<table>
<thead>
<tr>
<th>Aggression (N=10)</th>
<th>Fixation (N=10)</th>
<th>Regression (N=10)</th>
<th>Resignation (N=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Item Nos.</td>
<td>Test Item Nos.</td>
<td>Test Item Nos.</td>
<td>Test Item Nos.</td>
</tr>
<tr>
<td>4, 8, 12,</td>
<td>14, 18, 22,</td>
<td>26, 30, 34,</td>
<td>38.</td>
</tr>
<tr>
<td>16, 20, 24,</td>
<td>13, 17, 21,</td>
<td>25, 29, 33,</td>
<td>37.</td>
</tr>
<tr>
<td>40.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The items in this scale have been selected on the strength of judges' ratings (N=50); the criterion of selection being 75% occurrence of the item in a particular category of frustration. Each of the 40 items has been presented in a multiple choice type test item with five response-options graded on a 5 point scale on the positive dimension and a zero point on the negative dimension. The instructions are self-explanatory. The scale has been standardized over 991 Ss belonging to different strata of community; and norms have been developed in terms of sex,
grade, age and territorial differences. The co-efficients of reliability computed by 'test-retest' method for various modes of frustration are as under:

<table>
<thead>
<tr>
<th>Modes of Frustration</th>
<th>Co-efficient of stability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Aggression</td>
<td>.87</td>
</tr>
<tr>
<td>(ii) Fixation</td>
<td>.92</td>
</tr>
<tr>
<td>(iii) Regression</td>
<td>.78</td>
</tr>
<tr>
<td>(iv) Regression Resignation</td>
<td>.85</td>
</tr>
<tr>
<td>(v) As a whole</td>
<td>.88</td>
</tr>
</tbody>
</table>

The raw scores have been interpreted in terms of five point categorical description, i.e. the standard (35 and above), the high (30 - 34), the average (20 - 29), the low (15 - 19) and the clean (14 and below). Thus scores above 30 in former two categories are matters of concern because of high frustration potential. The individual profile presents a vivid description of different modes of frustration in one operation.
Measurement of Anxiety:

(a) The Concept:

Anxiety has been considered as an essential component of personality in the present world of confrontation and conflict. No separate test was available before 1950. However, Sarason and Mandler in 1950 developed their first separate test of 'Test Anxiety Questionnaire'. In 1953, a personality scale of manifest anxiety on the basis of MMPI was standardized by Taylor. The IPAT Anxiety Scale Questionnaire measuring overt, symptomatic and covert anxiety was developed by R.B. Cattell in 1957. Thus, Taylor's Manifest Anxiety Scale (1953) and Cattell's IPAT Anxiety Questionnaire (1957) contributed a lot in the measurement of anxiety as an independent measure of personality.

The Indian adaptation in Hindi under Indian conditions of Cattell's IPAT Anxiety Scale Questionnaire by S.D. Kapoor (1966) and of Taylor's Manifest Anxiety Scale by B.N. Singh and R.C. Thakur (1967) enriched the Indian literature on Anxiety Measurement. The construction and standardization of a W-A Sinha Anxiety Scale in Hindi (D. Sinha, 1966) by incorporating the construct and concept of Taylor's Manifest Anxiety Scale and Cattell's IPAT Anxiety Scale Questionnaire thereby measuring ten different...
dimensions of anxiety further accelerated the measurement of anxiety in India as one of the aspects of personality.

However, the measurement of anxiety as developed in India witnessed either the adaptation process under Indian conditions or the construction of a new anxiety scale almost based upon foreign tests. Since anxiety rather develops out of the socio-cultural interaction because of some conflicting and confronting socio-emotional conditions of life and work, it was felt essential that the anxiety scale should be developed on the foundations of the Indian culture reflecting the content validity of cultural complexities and social structure of India; and should be independent of foreign impact in matters of content, construct and technique. No originality is expressed in these anxiety scales constructed so far. A.K.P. Sinha (1975) regretfully recorded that, "in the anxiety field, no original scale is developed in our country so far". In view of the need to develop some original anxiety scale, A.K.P. Sinha and L.N.K. Sinha (1975) constructed and standardized a 'Comprehensive Anxiety Scale'. They specifically mentioned that "the disagreement and confusion centering around the concept of anxiety during the past three decades led the present authors to develop a comprehensive text of anxiety covering a variety of anxiety indices proposed by different investigators from time to
time. This scale was also found to be diagnostic of general neuroticism, besides anxiety states.

(b) Rationale of selecting a measure of Anxiety:

For measuring anxiety as one of the components of psychological stress in this study, Sinha's Comprehensive Scale, constructed and standardized by A.K.P. Sinha and L.N.K. Sinha (1975), has been employed on the grounds mentioned as under:

(1) Sinha's comprehensive scale is original in content, construct and concept, and has been developed out of the socio-cultural foundations of India. Thus, it possesses rather a greater relevance for the measurement of anxiety.

(2) Sinha's comprehensive scale has a wider application and greater scope in the measurement of anxiety than any other anxiety scale available in India.

(3) Sinha's comprehensive scale is quite suitable for the sample under-study from the points of view of language and content. It is easy in administration and more meaningful in interpretation.

(4) In addition, this comprehensive scale is diagnostic in nature which provides some additional benefits to the researcher.
Because of these advantages the Comprehensive Anxiety Scale over other available anxiety scales adapted in India, Sinha's comprehensive Anxiety Scale was employed in this study. The description of this Comprehensive Anxiety Scale has been presented below:

(c) The Description:

The 'Sinha's Comprehensive Anxiety Scale' constructed and standardized by A.K.E. Sinha and L.N.K. Sinha (1975) is an objective measure of anxiety. It consists of 90 items measuring symptoms of anxiety which have been retained out of 315 items, initially constructed, on the criterion of a coefficient of correlation being significant at .001 level.

The Ss are required to respond to each item in terms of 'yes' or 'no'. The coefficient of stability determined by test-retest method was 0.85 whereas the coefficient of internal consistency estimated by odd-even procedure using S-B formula was found to be 0.92. Both the indices of reliability ensure a high level of dependability of the test.

Sinha's Comprehensive Anxiety Scale has been validated against some of the measures of anxiety, the coefficients of validity of which are given below:
(i) Taylor's Manifest Anxiety Scale  \( r = .62 \) (\( P < .001 \))

(ii) Indian Adaptation of Cattell's IPAT Anxiety Scale Questionnaire by S.D. Kapoor  \( r = .54 \)

(iii) Sinha's WA Self-Anxiety Form:  \( r = .59 \)

Sinha's comprehensive Anxiety Scale is a self-administering inventory. Sex-grade percentile equivalents and classification into five categories on the basis of scores obtained on the inventory by an individual have been provided with a view to make the interpretation more meaningful and vivid.

3.222 Measurement of Motor Behaviour Reactions:

(a) The Concept:

Lazarus, R.S. (1966) has indicated 'threat as the key intervening variable in psychological stress analysis'. Anticipation of the harm visualized or expected which may thwart the motives of the individual constitutes the primary property of threat which depends on the cognitive ability of the individual that includes his perceptual ability, intellectual status, evaluative capacity and other higher mental processes. This latter property of threat makes
the anticipation of expected harm meaningful to the individual on the strength of his past experience and learning poten-
tiality, thereby accordingly regulating the abstractness and complexity of the threat appraisal process which may be said to be an intervening process between a stimulus and threat, and stress reactions.

Lazarus (1966, p. 7) points out that 'Motor behaviours signify reactions'. Tremor (Luria, 1932), increased muscle tension (Malmo, Shagass, Davis and Eng., 1951), speech disturbances (Mahl, 1956), particular facial expressions (Schlosberg, 1954), gestural activity and body movement as well as the behavioural reactions of flight and attack or aggression are some of the stress indicators of degree and direction of expressive acts through the action tendencies of attack, approach or avoidance. Even such acts as injury to some one else, solicitation of approval, creation in some one of an attitude, escape from harm, obtaining warmth, indigestion of food, and some of the gestural activities (Lazarus, 1966, p. 347) as instrumental to goals or intention are indicators of motor-behaviour reactions.

The motor behavioural reactions of threat can be expressed in terms of expressive and instrument acts.
An expressive act refers to the style or manner in which some goal oriented behaviour is performed whereas an instrumental act is characterized by the intention or goal (Lazarus, 1966). Allport and Vernon (1933), Arnheim (1928), W. Solff (1940), G. Klein (1958), Gardner, Holzman, Klein, Linton and Spence (1959); Witkin, Lewis, Machover, Meissner and Wapner (1954), Witkin et al (1962), Witkin (1965), S. B. Sarason (1954), Scharfer (1948, 1954), Luborsky, Blinder, and Schimek (1965); Gardner et al. (1959), Levine and Spivack (1964), Frkman (1964), Foley (1947), Mahl (1961, 1963), Panek and Martin (1959), Boring (1950), Scholsberg (1954), Suesch (1953), Hargreaves, stark weather, and Blacker (1965), Singer and Antrobus (1964) studied the different aspects of expressive and instrumental acts as indicators of motor behaviour reactions.

(b) The Rationale:

Numerous studies as cited above indicative of motor-behaviour reactions as one of the measures of stress having a base on threat as anticipatory mechanism to expected harm to the individual have been conducted by using certain expressive or instrumental acts. Since motor behaviour reactions are too varied as well as too specific, no standardized scale could meet the specific purpose of any behavioural measurement under study. Consequently, a 'Motor Behaviour Reaction' scale has been developed on the concept of 'threat' explained above.
(c) The construction and Standardization Process of Motor-Behaviour Reaction Scale (MBRS):

The MBRS was designed to measure the motor behaviour reaction as one of the measures of stress inherent among the Ss. The scale includes the Expressive as well as Instrumental acts.

First of all, a number of such items which indicate motor behaviour reactions expressive of stress were collected. Five judges from the field of psychology were requested to screen the items on the strength of their relevance and appropriateness.

Semantic differential technique was employed in designing the scale. From the selected list of items, 35 revealing bipolar adjectives or abstract nouns as listed below were retained for proper tryout.

List of 35 Items selected for proper Try-out:

1. Stress tolerance
2. Combat dream
3. Sleep disturbance
4. Insomnia
5. Loss of various personal skills
6. Inability to concentrate
7. Loss of other ego-functions
8. Irritability
9. Excessive jumpiness
10. Easily fatigued
11. Severe headache
12. Momentary block outs
13. Dizziness
14. Avoiding rivalry
15. Diarrhoea
16. Self-blaming
17. Difficulty in accepting loss
18. Blaming others
19. Escapism
20. Execution of acts associated with deceased
21. Belief that deceased is still alive
22. Sense of presence of the deceased apathy
23. Feeling of fear
24. Shame and guilt (as a source of threat)
25. Injury to some one else
26. Solicitation of approval
27. Escape from harm
28. Increased muscle tension
29. Speech disturbance
30. Feeling of flight by the sight of painful objects
31. Obtaining warmth
32. Increased errors
33. Burst of response
34. Desire to attack the rivals
35. Increased Omissions and commissions

These items were designed into 5 point scale, and were then, tried out over a small sample with a view to estimate its effectiveness. Ten non-functional and invalid items were eliminated on the strength of their indexed of discrimination, computed from the total scores obtained by two extreme groups of Ss i.e.

(a) Very aggressive (N = 5), and

(b) Non-aggressive (N = 5).

These Ss were selected and categorized by a pool of 5 judges on the criteria of objective observation of their Expressive Motor Behaviour Reactions to certain threat generating stimuli. These 25 items, thus, retained were then arranged in descending order of their indices of discrimination and top 20 were selected for their inclusion in the MERS on the strength of their discrimination value. The mean index of discrimination (ID) was estimated to be 0.57, while they ranged between 0.38 and 0.81.

These 20 bipolar items constitute the content of the Motor Behaviour Reaction Scale.
The MBRS was, finally, tried out over the normative sample for the purpose of developing norms. The coefficient of stability estimated by the Test-Retest method was found to be 0.693 whereas the coefficient of internal consistency computed by Split Half technique using Spearman-Brown formula was estimated to be 0.812. The MBRS was validated against two extreme groups of Ss: (i) High Anxiety, and (ii) Low Anxiety, and the coefficient of Predictive Validity was found to be 0.771.

3.223 Measurement of Electro-Physiological Indicators:

(a) The Concept:

Physiological indicators objectively mirror the metabolic changes and energy mobilization in the internal body system of an individual. This includes reactions of both the autonomic nervous system as reflected in end-organ activity of the heart, respiratory organs, sweat glands etc., and the adrenal glands which secrete various hormones under stress. A very large psychophysiological literature detailing the mechanisms of autonomic nervous system reactions and secretions of the adrenal glands is available in such sources as Arnold (1960), Berlyne (1960), Brady (1962), Funkenstein, King and Drolette (1957), Lacey (1959), Lindsley (1951), Valmo (1959), Roessler and Greenfield (1962), Jelye (1956), Martin (1961) etc.
Many end-organ responses which are connected with the autonomic nervous system have traditionally been studied as indicators of stress, including GSR, blood pressure, heart rate, palmer sweat, respiration, skin temperature etc. (Lacey, 1959; Malmo, 1959; Brady, 1962; Tanner, 1960; Chambers and Reiser, 1953; Bixenstine, 1955; Leivinsotin, 1956; J. Schactely, 1957). Biochemical studies of adrenal cortical secretions have been greatly stimulated by the research of Selve (1956), Hamburg (1962), Funkenstein, King and Drolotte (1957), Ax (1953), Lacey et al. (1963), Schachter and Singer (1962), Perskey et al. (1959), Brady, Porter, Conrad and Mason (1958) etc.

According to neuro-physiologists, emotion has an anatomical as well as a functional line of evidence for its arousal. Magocen (1954) and others have pointed out that a certain part of the central nervous system which is known as a reticular formation is especially concerned with alertness, attention, and other forms of mental activity. Injury to the reticular formation includes somnolence, while electrical or chemical excitation of this system results in arousal. "The arousal is seen physiologically in the blockage of alpha rhythms in the EEG, the appearance of beta rhythms, and the autonomic and humoral activity that is typically found in emotional states (Lazarus, 1966, p. 366). Arnold (1960), Berlyne (1960), Brady (1962),
Lindsley (1950, 1951) and Malmo (1959) etc. have also expressed similar views on the structure and function of the reticular activating system.

The functional line of evidence is supported by the relationship between mental states and the EEG, and autonomic response pattern (Berger, 1930; Friedl, 1954; Cohn, 1949 and Kennard, 1953). The concept of energy mobilization (Cannon, 1934, Duffy, 1957) and activation theory (Lindsley, 1951) also support the psychological construct of emotion within the unidimensional concept of arousal. According to the latter theory, the concept of energy is identified as a condition of neural excitation of the reticular formation which accounts for the various humoral, autonomic and cortical activities and electroencephalographic changes. (Lazarus, 1966; Malmo, 1959; Duffy, 1957, 1962; Dell, 1958). However, for its being a constituent part of psychological stress, both the emotion and its arousal, activation or excitation should be necessarily the outcome of a threat anticipating some harm to the individual.

(b) **The Rationale:**

Neuro-physiologists have measured the psychological stress by employing various electro-physiological indicators. They function on the concept of arousal,
activation or excitation of energy or emotion under the conditions of threat anticipatory to some harm to the person subjected to psychological stress. Some of these electro-physiological measures are:

(a) GSР (Galvanic Skin Response)
(b) ECG (Electro-Cardiogram)
(c) EМG (Electromyogram Muscle Tension)
(d) EEG (Electro-Encephalogram)
(e) Breathing Rate and Amplitude (Phenogram)
(f) Blood Pressure and Blood Volume
(g) Pupillary Dilation (Size)
(h) Finger temperature/feet sweating
(i) Palmer Sweating
(j) Salivary output
(k) Other such measures.

Though each one of these electro-physiological indicators reflect the inner status of body-system involving the metabolic changes and energy mobilization measures, all these were neither feasible nor essential. Since the data on these measures were collected on sophisticated electrical instruments, their availability constituted an important criterion of inclusion of some of these indicators. Further, some of these measures like EEG, ECG etc. are rather more important and significant than others like palmer sweating and skin temperature. Moreover, the data
on more important electro-physiological indicators enhance the significance of the study.

Keeping in view the relevance, the feasibility, the significance, the specificity, the essentiality, the availability of the electro-physiological instrument, the following three electro-physiological indicators as measures of psychological stress were included in the study. Data have been collected only on these three measures by using a four channel Polyrite available in the Department of Psychology, Ravishankar University, Raipur.

The three electro-physiological indicators are:

(i) EEG
(ii) EKG, and
(iii) EMG.

(c) The Electro-physiological Instrument: Polyrite

Description:

The polyrite recorder is a highly sensitive oscillograph capable of simultaneously recording signals in different modes from many sources. However, the present polyrite is a four channel system of recording, out of which we have employed the instrument for three:
(i) EEG, (ii) EKG, and (iii) EMG.

Each separate record inscribed on the chart requires a separate channel which consists of an amplifier and pen motor. The signal is fed into the amplifier directly by the use of suitable electrodes. All modules are fully solid state and are designed using integrated circuits, high stability components and printed circuit boards. The chart drive is the unit which moves the chart paper past and under the stylus of a writing element while the time and event module is an optimal accessory. The latter module permits double range time marking of 1 and 10 sec. (or 5 and 30 sec; or 10 and 1 minute), if specified while ordering. The event marker push button records the event by producing a 40 cycle wave for as long as the push button is depressed. This channel is also modular in construction and can be taken out by just unscrewing two thumb screws.

The basic purpose of the polyrite recorder is to amplify a very small signal and use it to cause a pen deflection that is directly proportional to the size of the signal. The signal itself may come from an infinite variety of voltage producing sources; and is fed to an amplifier for signal conditioning and primary amplification. The output of the amplifier is a driving force which will cause the coil in the pen motor to rotate in one direction or the other depending upon the polarity of the signal.
A detailed description of the basic modules, circuit analysis, cycle interference, recorder section, consisting of console controls, loading chart paper, pens description, inkwells, electrode connections, calibration and other minor or major aspects of the polypeptide has been provided in the Manual of polypeptide, designed by Instruments and Chemicals (P) Ltd., Ambala, (India).

The concept of specificity:

Lacey, Bateman and van Lehn (1953), Lacey and Lacey (1958), Engel and Bickford (1961), Moos and Engel (1962) have proposed the concepts of stimulus and response specificity. "These concepts imply that different autonomic reaction patterns are associated with the specific threat or noxious stimulus (stimulus specificity) and further, that different autonomic reaction patterns are consistently found in different individuals across different kinds of threat (individual response specificity)" (Lazarus, 1966, p. 374). Further, each type of indicator reflects a specific kind of transaction between the individual and the situation. These stimulus, response, individual and situational specificity concepts lead us to conclude that each of the indicators, would also measure the psychological stress which would be specific in nature, kind and orientation. Hence "we should not really expect high agreement among indicators"- (Lazarus, 1966, p. 390).
3.3 DESIGN OF THE STUDY:

The scientific nature of a study depends largely upon the effective planning and execution of research projects. Accurate designing of the project constitutes an integral part of effective planning which ensures high indices of reliability and validity of the result. The researcher should have insight to fully visualize the entire research process and to tailor various steps systematically and sequentially from the beginning to the end so that a sound cause-consequence relationship is established. Further, scientific processing not only facilitates the execution of research programmes, but also brings out accurate and dependable results.

The study as a whole has been covered up into three categories of designs as mentioned below. The scheme has been prepared in accordance with the hypotheses formulated.

Design - A: Correlational Study:

Hypotheses \( H_1, H_2 \) and \( H_3 \) deal with the inter-relationships among the dependent and independent variables as specified in chapter I under 'Hypotheses formulations'.
(i) Aspiration Scales: Educational and Occupational, and (ii) n Ach Inventory; and the level on these two measures have been studied in relation with the three indicators of the psychological stress as mentioned earlier.

Design B: Comparative study of Psychological Stress of High and Low Achievement Motivation and Aspiration Groups:

Hypothesis $H_4$ deals with the differential pattern of psychological stress of two extreme groups; the high and the low categorized in terms of Achievement Motivation and Aspiration: Educational and Occupational. The design used for collecting the differential data on dependent variables of the two extreme groups as specified above has been diagramatically sketched below:
Independent variables

<table>
<thead>
<tr>
<th>n Ach</th>
<th>Level of Aspiration</th>
<th>Dependent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Indicate the kind and degree of Psychological stress in terms of:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>n Ach</th>
<th>Level of Aspiration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---------------------------------------------------------------

I. Negative Toned Affects:
(a) Frustration
(i) Fixation
(ii) Aggression
(iii) Regression
(iv) Resignation

(b) Anxiety

II. Motor Behaviour Reactions.

III. Electro-physiological Indicators.
(i) EEG
(ii) EKG
(iii) EMG

Design - C: Differential Study of Psychological Stress of different stratified samples:

By-Hypotheses: BH1, BH2, BH3, BH4, BH5 and BH6 have been formulated with a view to show significant differences between the Means on various indicators of psychological stress of different stratified samples. Obviously, the
collection of data follows the proper stratification of the normative sample and then estimating the level of difference between Means of any two stratified samples. The normative sample has been stratified on the basis of (i) Sex differences, (ii) Educational Maturity, (iii) Educational streams offered by Ss, (iv) Socio-economic status, (v) Caste differences, and (vi) Territorial differences.

The study has been so designed as to collect data on these biographical aspects also.

3.4 PROCEDURE FOLLOWED:

The procedure deals with the way the data has been collected. It takes into consideration how: (i) the rapport was established with the subjects before the collection of data was initiated, (ii) the responses were recorded, (iii) the instructions were delivered to the subjects with a view to respond to the stimuli presented to them, (iv) the tests were administered, (v) the instruments were operated, (vi) time was scheduled for the administration of the test and operation of the instrument, (vii) precautions were observed in the conduct of research and collection of data by employing various instructions and psychological tests, and (viii) the situational and other variables affecting the results were controlled.
The entire procedure followed with respect to the above aspects of collecting the data has been discussed here under two heads:

(i) Rapport and Responses,

(ii) Administration of Psychological tests and Operation of Polyrite Recorder.

(iii) Identification of extreme criterion groups.

(iv) Data-collection sessions.

3. 4 Rapport and Responses:

A testing programme was chalked out and communicated well in advance of the actual date of the test-administration to all the Heads of the Educational Institutions with a request to extend their whole hearted cooperation in collecting the required data as specified in the testing programme from the students of their institutions. The nature, kind and size of the sample, time required and other essential requirements were vividly recorded there.

On the date of Testing Programme, the Head of the Educational Institution was contacted at least before an hour and all the arrangements for the administration of the tests scheduled on that date were personally made with the cooperation of the school or departmental personnel.
Physical environments and socio-emotional interactions with the persons involved in the Testing Programme were maintained as identical as possible in all testing sessions.

The investigator was invariably introduced to the Ss by one of the members of the teaching staff. The teacher-in-charge of the class worked as proctor during the Testing Session. Before the tests were administered, the investigator motivated the pupils for their active participation in the testing programmes by extending their whole-hearted cooperation in the collection of data. The purpose of the study was specifically stated, and free and frank responses were requested for. They were also directed not to leave any item; and to strictly follow all the instructions and observe precautions given by the investigator.

The technique of establishing rapport and eliciting responses on polyrite was rather more personal since the psychographs were recorded individually which permitted for closer contact with the subject. However, leaving aside the technical instructions given to the subjects and precautions observed by the investigator in polygraph recordings, the mode of socio-emotional interactions for establishing rapport with the subjects remained unaltered.
3.42 Administration of Psychological Tests and Operation of Polyrite Recorder:

The data on psychological tests was personally collected by the investigator in convenient groups of about 30 Ss per session whereas on polyrite, psychographs on the three electro-physiological indicators (i.e. EMG, EKG and EHG) were individually recorded. The data on psychological tests were collected in the educational institutions whereas the electro-physiological recordings on polyrite of the selected groups of students from each of the eight categories of pupils as mentioned earlier in this chapter under 'sampling technique' or 'design of the study' were done in the Psychological Laboratory of the Ravishankar University, Raipur. Proper rapport was invariably established with the Ss before the collection of data. Instructions recorded in the manual of norms of the psychological tests administered were strictly followed. Similarly, the polyrite records were obtained under the controls and precautions mentioned in the manual of Polyrite designed by Instruments and Chemicals (P) Ltd., Ambala, (India).

The procedure adopted in the operation of Polyrite is sketched below.
<table>
<thead>
<tr>
<th>Circuit Connections</th>
<th>Chart Speed</th>
<th>Input Time</th>
<th>Balance</th>
<th>Sensitivity</th>
<th>Base Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>EKG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I RA, La</td>
<td>25 mms</td>
<td>cut off</td>
<td>use, 1 m volt and further adjustment</td>
<td>CN (centre)</td>
<td></td>
</tr>
<tr>
<td>(G2) G1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II RA, LL</td>
<td>Ground 25''</td>
<td>1 sec</td>
<td>x</td>
<td>x adj. for having a base line</td>
<td></td>
</tr>
<tr>
<td>= RL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III LA, LL</td>
<td>25''</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 strap on LA</td>
<td>Ground 50/25</td>
<td>.03 sec</td>
<td>x</td>
<td>variations according to sensitivity</td>
<td>CN</td>
</tr>
<tr>
<td>= RL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EEG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 points at backside of the head</td>
<td>Ground 50/25</td>
<td>.1 sec</td>
<td>x to be made</td>
<td>CN 50H3 Filter</td>
<td></td>
</tr>
</tbody>
</table>
3.43 Identification of Extreme Criterion Groups:

The data for Hypothesis $H_1$, $H_2$ and $H_3$ were collected on the total normative sample whereas for by-hypothesis $BH_1$, $BH_2$, $BH_3$, $BH_4$, $BH_5$ and $BH_6$, they were collected by stratifying the normative sample into different stratified samples, in terms of sex, educational maturity, educational streams, socio-economic status, caste and territorial differences. Identification of sample and procedure for collecting the data for these hypotheses were, therefore, no problems for the investigator.

For putting Hypothesis $H_4$ test, extreme group samples have been identified on three independent variables: (i) Achievement Motivation, (ii) Educational Aspiration, and (iii) Occupational Aspiration.

The high and low criterion groups on a psychological continuum of sample distribution were identified on the strength of their $Q_3$ and $Q_1$ limits respectively on each of the independent variables. All pupils scoring above 75th percentile limit on each of the independent variables were classified into 'High' extreme group whereas all those who scored before 25th percentile limit were categorized as 'Low'. The residuals were eliminated from the study.
The $Q_3$ and $Q_1$ limits as criteria of identification on each of the independent variables of 'High' and 'Low' extreme groups respectively have been presented below:

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Extreme Groups</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High (above $Q_3$)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low (below $Q_1$)</td>
<td></td>
</tr>
<tr>
<td>1. Achievement Motivation</td>
<td>10.4321</td>
<td>6.6377</td>
</tr>
<tr>
<td>2. Educational Aspiration</td>
<td>32.3750</td>
<td>26.0895</td>
</tr>
<tr>
<td>3. Occupational Aspiration</td>
<td>57.0000</td>
<td>48.6611</td>
</tr>
</tbody>
</table>

The two criterion groups on each of the independent variables for all treatment purposes, have been grouped into the eight extreme group samples as given below:
3.4 Data Collection Sessions:

The data on various psychological tests, and polyrite were collected in four sessions. The specification of the testing and experimental sessions has been presented below:

<table>
<thead>
<tr>
<th>Psychological Tests</th>
<th>Time Allowed in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. First Session: Testing:</td>
<td></td>
</tr>
<tr>
<td>(i) Administration of Occupational Aspiration Scale</td>
<td>30</td>
</tr>
</tbody>
</table>
(11) Administration of Motor Behaviour Reaction Scale

Total: 45

B. Second Session : Testing-

(i) Administration of Educational Aspiration Scale 25

(ii) Administration of Frustration Scale 25

Total: 50

C. Third Session : Testing:-

(i) Administration of m Aeh Inventory 25

(ii) Administration of Anxiety Scale 25

Total: 50

D. Fourth Session : Laboratory Experimentation :-

(i) Operation of Polyrite

Electro-Physiological Indicators: 55

(i) EEG, (ii) EKG, (iii) EMG.

Grand Total: 3 hours and 20 minutes
3.5 Data Processing and Analysis:

After having collected the data on various psychological tests and polyrite, the investigator tried to make them meaningful by scoring, processing, analysing, tabulating and statistically treating in accordance with the hypothesis formulated.

3.51 Scoring: The data collected in this study could be broadly categorized into two classes:

(i) Objective responses obtained on the psychological tests employed in this study, and

(ii) The polyrite records: Psychographs.

The responses of the Ss on the objective tests were scored by the investigator personally by using the hand-scoring keys. The scoring done by the investigator was checked by another judge. The directions given in the manual of norms for scoring the test items on various psychological tests under-use were strictly followed.

The psychographs presented the graphical representation of the inner working of the subject's brain reflecting, thereby the psychological stress through electro-physiological indicators, namely EGG, EKG and EMG. In all cases, for all subjects, the nature and kind of psychograph records revealed the characteristic responses in terms of number of cycles/per unit of time.
The number of scores obtained in the study on the independent and dependent variables have been presented below:

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>N</th>
<th>Dependent variables</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychological Stress</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Achievement Motivation</td>
<td>4</td>
<td>I. Negative Toned Affect</td>
<td>5</td>
</tr>
<tr>
<td>Scores:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) A R Score</td>
<td>1</td>
<td>(a) Fixation:</td>
<td>1</td>
</tr>
<tr>
<td>(b) U R Score</td>
<td>1</td>
<td>(b) Aggression:</td>
<td>1</td>
</tr>
<tr>
<td>(c) T R Score</td>
<td>1</td>
<td>(c) Regression:</td>
<td>1</td>
</tr>
<tr>
<td>(d) A M I Score</td>
<td>1</td>
<td>(d) Resignation:</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Aspiration Scores</td>
<td>2</td>
<td>(ii) Anxiety</td>
<td>1</td>
</tr>
<tr>
<td>(i) Educational</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) Occupational</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II. Motor Behaviour R</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Expressive</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act Score:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) Instrumental</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act Score:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Electro-Physiological Psychophy graphs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) EEG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) EKG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) EMG</td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td>6</td>
<td>Total</td>
<td>7 +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Psychographs</td>
<td></td>
</tr>
</tbody>
</table>
3.52 Treatment of the Data:

The scores obtained by each individual subject on various psychological tests were systematically recorded under the relevant category of independent or dependent variables. The responses were tabulated categorically as well as separately in accordance with the hypotheses formulated and the design of the study. With a view to make the treatment of data more meaningful and vivid, data were processed, analyzed and tabulated by hypothesis and in each case, statistical treatment was specified. The statistical computations were done by electronic calculator, available at University Teaching Departments, Ravishankar University, Raipur. The Statistical treatment of the data as operated in this study has be presented below in a tabular form.
Design and Hypothesis | Interaction of Variables | Statistical techniques employed
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Variables</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>Dependent</td>
<td></td>
</tr>
</tbody>
</table>

**Design A: Correlational Study:**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Independent Variable</th>
<th>Dependent Variables</th>
<th>Statistical Techniques Employed</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₁</td>
<td>(i) n Ach</td>
<td>I Negative Toned Affect (i) Frustration</td>
<td>Pearson's Product Moment Coefficient of correlation.</td>
</tr>
<tr>
<td>H₂</td>
<td>(ii) Educational Aspiration</td>
<td>Fixation Aggression Regression and Resignation</td>
<td></td>
</tr>
<tr>
<td>H₃</td>
<td>(iii) Occupational Aspiration</td>
<td>(ii) Anxiety II Motor Behaviour Reaction</td>
<td></td>
</tr>
</tbody>
</table>
Design B: Comparative Study:

\[ H_0 \]

(i) \( H_n \text{ Ach} - H_{Ea} - H_0 \)  

(ii) \( H_n \text{ Ach} - H_{Ea} - L_{Ca} \)  

(iii) \( H_n \text{ Ach} - L_{Ea} - H_{0a} \)  

(iv) \( H_n \text{ Ach} - L_{Ea} - L_{Ca} \)  

(v) \( L_n \text{ Ach} - H_{Ea} - H_{0a} \)  

(vi) \( L_n \text{ Ach} - H_{Ea} - L_{0a} \)  

(vii) \( L_n \text{ Ach} - L_{Ea} - H_{0a} \)  

(viii) \( L_n \text{ Ach} - L_{Ea} - L_{0a} \)

(i) Negative Toned Affect  

(ii) Frustration:  

- Fixation  
- Aggression  
- Regression and Resignation

(iii) Psychographs on  

- EEG, (b) EKG, and (c) EMG of all eight categories and their technical analysis and interpretation

Design C: Differential Study: Psychological stress found differentiated in accordance with

\[ BH_1 \]

(i) Sex differences  

(ii) Educational Maturity  

(iii) Educational stream  

(iv) Socio-economic status  

(v) Caste differences  

(vi) Territorial differences

Mean, SD and t value
CHAPTER IV

FINDINGS, THEIR INTERPRETATIONS AND DISCUSSIONS

4.0 Introduction

4.1 Findings, interpretations and discussions on hypothesis I, II, and III:
(a) Test of Normalcy of Distribution of Scores.

4.11 Achievement Motivation and Psychological Stress ($H_1$).

4.12 Educational Aspiration and Psychological Stress ($H_2$).

4.13 Occupational Aspiration and Psychological Stress ($H_3$).

4.2 Findings, Interpretation and Discussions on Hypothesis IV.

4.21 Psychological Stress Inherent in Extreme Independent Groups ($H_4$).

4.3 Findings, Interpretations and Discussions on By-Hypotheses.

4.31 Sex Difference and Psychological Stress ($B-H_1$).

4.32 Developmental differences in Psychological Stress ($B-H_2$).
4.33 Differences in terms of Educational Streams offered and Psychological Stress (B-H$_3$).

4.34 Differences in terms of Socio-Economic Status of Pupils and their psychological stress (B-H$_4$).

4.35 Differences in Caste of pupils and their psychological stress (B-H$_5$).

4.36 Territorial differences and psychological stress (B-H$_6$)

4.40 A Global view on Results, their Interpretations and Discussions.