CHAPTER III

METHOD AND PROCEDURE

In this chapter the method and procedure used to compare the psychological characteristics of individual and team athletes, and of various sports groups have been explained. Since the basic comparison is between the two categories of athletes namely individual and team athletes; and, successful and unsuccessful athletes, bivariate analytical procedures were used. Further, to analyse the psychological differences among the athletes of various sports groups of both the categories, multivariate analytical technique was used.

The sample for the present study was drawn from the colleges affiliated to the Panjab University, Chandigarh and from Panjab University Campus. Nearly ninety colleges are affiliated to this University. These colleges are situated in the three districts of Ludhiana, Ferozepur and Hoshiarpur of the Panjab State, and in the Union Territory of Chandigarh.

Panjab University, Chandigarh conducts preparatory coaching camps in each sport discipline prior to the inter-university competitions. Selection trials are organised, in which budding athletes from various colleges compete to make the grade for the respective coaching camps. Probables for these camps are selected by the duly constituted selection
committees comprising experts.

Sample

Systematic cluster sampling technique was employed to choose the respondents. Respondents were selected by the selection committees of the respective sports to undergo coaching camps prior to the All India Inter-varsity competitions. In all two hundred and two athletes (eighty eight individual athletes and one hundred fourteen team athletes) who had made the grade in the respective coaching camps formed the total sample.

Selection of sports events and games

Keeping in view the facilities, popularity and standing of Panjab University, the following twelve sports events and games were selected:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sports event for individual athletes</th>
<th>(N)</th>
<th>Games for team athletes</th>
<th>(N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Track &amp; field (sprinting and jumps)</td>
<td>18</td>
<td>Basketball</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>Boxing</td>
<td>19</td>
<td>Football</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>Cross-country races</td>
<td>11</td>
<td>Handball</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Gymnastics</td>
<td>03</td>
<td>Hockey</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Wrestling</td>
<td>20</td>
<td>Kabaddi(NS)</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>Weight-lifting</td>
<td>17</td>
<td>Volleyball</td>
<td>15</td>
</tr>
</tbody>
</table>

Total = 88                                      114

Grand total: $88 + 114 = 202$
The category wise break-up of successful and unsuccessful individual and team athletes was as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful individual athletes</td>
<td>65</td>
</tr>
<tr>
<td>Unsuccessful individual athletes</td>
<td>23</td>
</tr>
<tr>
<td>Successful team athletes</td>
<td>79</td>
</tr>
<tr>
<td>Unsuccessful team athletes</td>
<td>35</td>
</tr>
<tr>
<td>Total successful athletes</td>
<td>144</td>
</tr>
<tr>
<td>Total unsuccessful athletes</td>
<td>58</td>
</tr>
</tbody>
</table>

**Selection of Variables**

To compare the psychological characteristics of the individual and team athletes, the variables have been selected keeping in view their significance from the point of view of performance. Primarily the variables belong to three basic areas: Adjustment, Extraversion, Neuroticism (behavioural aspect) and vigilance (cognitive aspect). The list of variables used is given below:

1. Home Adjustment
2. Health Adjustment
3. Social Adjustment
4. Emotional Adjustment
5. Educational Adjustment
6. Total Adjustment
7. Extraversion
8. Neuroticism
9. Psychoticism
10. Vigilance

Tools Used

Keeping in view the research criteria of availability, suitability, reliability and validity, the following tools were used to collect the data.

(I) Adjustment Inventory for College students of Sinha and Singh (1980) was used to measure all the dimensions of adjustment (Home, Health, Social, Emotional and Educational) and total adjustment of the subjects.

(II) Eysenck Personality Questionnaire of Eysenck (1978), which was standardised by Mohan and Virdi (1985) on Panjab University students, was used to measure the behavioural dimensions of personality (Extraversion, Neuroticism and Psychoticism) of the subjects.

(III) Cognitive Vigilance Task (adapted version) Mohan, J. (1982) was administered to measure the levels of vigilance of the subjects.

All these tests have been standardised in the Indian cultural context and are used extensively. A specimen copy of each of the tests used in the present study has been provided in Appendices A, B & C.
Adjustment Inventory for College Students: The Adjustment Inventory used for present study is a well-known tool for measuring all the dimensions of adjustment and the total adjustment of college students. The five areas of adjustment covered by this inventory are: Home, Health, Social, Emotional and Educational. Reliability coefficient of the inventory are presented in the following table.

Reliability coefficient of the inventory by using different methods:

<table>
<thead>
<tr>
<th>Method used</th>
<th>Home (a)</th>
<th>Health (b)</th>
<th>Social (c)</th>
<th>Emotional (d)</th>
<th>Educational (e)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split half</td>
<td>.87</td>
<td>.83</td>
<td>.96</td>
<td>.95</td>
<td>.97</td>
<td>.94</td>
</tr>
<tr>
<td>Test-retest</td>
<td>.85</td>
<td>.82</td>
<td>.95</td>
<td>.94</td>
<td>.96</td>
<td>.93</td>
</tr>
<tr>
<td>Hoyt's Method</td>
<td>.86</td>
<td>.85</td>
<td>.95</td>
<td>.95</td>
<td>.94</td>
<td>.94</td>
</tr>
<tr>
<td>K-R Formula-20</td>
<td>.84</td>
<td>.82</td>
<td>.92</td>
<td>.94</td>
<td>.93</td>
<td>.92</td>
</tr>
</tbody>
</table>

The above listed areas of inventory are inter-independent. Validity coefficients for each item obtained through bi-serial correlation method was significant at .001 level. The subject can be classified into five categories in accordance with the raw score obtained by them on the inventory. The five different categories for adjustment are: 'a' which stands for excellent, 'b' which stands for good, 'c' which stands for average, 'd' which stands for unsatisfactory,
and 'e' which stands for very unsatisfactory. Separate classification of adjustment with respect to home, health, social, emotional and educational is also done against the five different categories of inventory. Classification tables are given in the manual of the inventory.

The area-wise description of the trend on the basis of raw score is as follows:

(a) **Home adjustment:** Low scores indicate satisfactory adjustment. Individuals scoring high tend to be unsatisfactorily adjusted towards their home.

(b) **Health adjustment:** Low scores indicate satisfactory health adjustment and high scores show unsatisfactory adjustment.

(c) **Social adjustment:** Individuals scoring high are submissive and retiring sorts. Low scores indicate aggressive behaviour.

(d) **Emotional adjustment:** High scores indicate unstable emotions. Individuals with low scores tend to be emotionally stable.

(e) **Educational adjustment:** Individuals scoring high are poorly adjusted towards their curricular and co-curricular programmes. Persons with low scores are interested in the educational activities.
(ii) **Personality Questionnaire (Eysenck & Eysenck, 1978):**

The personality theory developed and modified by Eysenck over the years (1947, 1957, 1960, 1964, 1970, 1972 and 1978) posits four major dimensions of personality viz., Extraversion/Introversion, Neuroticism/Stability, Psychoticism and Intelligence which are uncorrelated. The latest in the series being E.P.Q. (Eysenck Personality Questionnaire) (Eysenck and Eysenck, 1978) assesses three major personality dimensions: Extraversion, Neuroticism and Psychoticism in addition to possessing a lie scale to check dissimulation. For the present study, the standardised version of E.P.Q. was used to measure Extraversion, Neuroticism and Psychoticism. The E.P.Q. was standardised on the students of Panjab University by Mohan and Virdi (1985). The internal consistency and reliability was established by using odd-even method and the scores in order to be so had to be within the range of +.36 and +.86 (i.e. E+ .69; N+ .86; P+ .36 and L+ .78). The correlation on the test-retest reliability (with an interval of one month) was found to be much higher i.e. E+ .93; N+ .96; P+ .85 and L+ .96. They concluded that the E.P.Q. is a reliable measure of the stated personality dimensions for the Indian population especially in case of the students of Panjab University.

In general, the theory as well as questionnaire of personality developed by Eysenck seem to be logical,
dependable and relevant to the Indian culture.

(iii) Cognitive Vigilance Task: For the present study, Cognitive Vigilance Task (CVT; Number form) was administered to obtain the data. The subjects were to encircle the adjoining two numbers, whose total should be thirteen (13) i.e. the detection of correct signal. The score of the individual was equal to the number of correct responses, minus the incorrect and uncovered responses made in five minutes. A specimen copy of the CVT has been supplied in Appendix-C. This is the most common measure used in the studies on vigilance performance where the number of signals is to be detected correctly. The breakthrough in vigilance research was primarily achieved by Mackworth (1948, 1950, 1957 and 1968). The CVT was found by Malhotra (1974), Sen and Sachdev (1977) and Mohan (1980), to be a reliable tool worthy of administration to the subjects of Panjab University, Chandigarh.

Administration of tests

To administer all the tests as per the specified instructions, the researcher had to seek cooperation from many quarters. The subjects included in the present study were selected probables in their respective sports. Panjab University, Chandigarh had organised preparatory coaching
camps, from the month of September, 1986 to February, 1987, for the twelve sports included in the study. First of all the permission was obtained from the Director of Sports of Panjab University, Chandigarh to conduct experiments on the selected probables during the initial stage of the coaching camps. Information regarding the dates, venue and timings of each coaching camp was also obtained well in advance. As soon as each coaching camp had started the cooperation of the officials conducting the camps was sought to administer the tests. They were acquainted with significance and purpose of the study. Timings of administration of the tests were decided in consultation with them so that the coaching schedule was not disturbed.

The questionnaires (E.P.Q. and Adjustment Inventory) used in the study were of extensive nature. The third test of CVT also demanded separate sessions for their administration to the subjects. To have a uniform pattern, it was decided to administer the tests on 4th, 5th and 6th days of the respective camps. On the appointed day, the subjects were called 40 minutes before the coaching for the day would start. All the tests were conducted in the afternoon. It took almost five minutes to distribute necessary materials (questionnaire, pencil and hard board). In the next five minutes the instructions, as specified in the tests, were given and doubts sought by subjects were clarified. Group
method of testing was adopted. In the case of Personality Questionnaire and Adjustment Inventory, the subjects were told to complete the test as early as possible to meet the demands of the test. Most of the subjects completed the said questionnaires within thirty minutes. If any subject lagged behind he was allowed to complete the task quickly. Each subject was asked to handover the response-sheet immediately after it was filled.

In the case of cognitive vigilance task, its number form response sheet were distributed to the subjects. The instructions were repeated. The procedure to be followed was explained on the black board. Since the subjects were to encircle the adjoining two numbers, whose total should have been thirteen to get the correct score, a trial run was conducted to facilitate task of the subjects. After familiarising them with the test, the trial response sheets were replaced with the fresh ones, and this time, after getting them ready, the task was started on the signal 'begin'. The time allowed for the test was five minutes, after which the subjects were asked to stop writing, and return the response sheets immediately.

Method of Scoring

The three different criterion measures used to obtain the data differed in the following manner regarding their
method of scoring.

**Personality Questionnaire:** The personality questionnaire used in this study assesses extraversion, neuroticism and psychoticism. Each dimension is considered as an independent variable. The scoring was done with the help of the key of the questionnaire. The scores of each dimension were summed up separately and were transferred on the consolidated sheet.

**Adjustment Inventory:** The scoring of response sheets of each individual was done with the help of the key of the inventory. Key helped to classify the responses of each subject into five areas of adjustment:

(a) Home adjustment  
(b) Health adjustment  
(c) Social adjustment  
(d) Emotional adjustment  
(e) Educational adjustment.

The overall score of the five areas of adjustment mattered in the assessment of the total (overall) adjustment of subjects. The scoring key has been explained in the manual of the inventory.

**Cognitive Vigilance Task (CVT):**

In the number form response sheet of CVT, the subjects were to encircle the adjoining two numbers, whose total should
be thirteen. The score of the individual was equal to the number of correct responses, minus the number of incorrect and uncovered responses, all made in five minutes. First of all the correct responses were summed up to secure the total. Later the incorrect and uncovered responses were counted to obtain their total. The total of incorrect and uncovered responses was now deducted from the total of correct responses. The balance obtained was considered the score of the individual.

Statistical Analysis of Data

The data obtained through systematic cluster sampling were compiled and tabulated variable-wise. The statistical analysis was done on a computer. At the initial stage, the values of means, standard deviations, t-ratios of all the variables were computed to know the level of significance of the differences of individual athletes and team athletes on each variable.

At the second stage Analysis of Variance (ANOVA) test was applied to know the significance of differences among various individual and team groups against each variable. Where the differences were found significant at .05 level of confidence, the t-test was applied and results were tabulated in the form of t-matrix to know the level of significance of differences among various groups.
Finally, the differentials among the successful and unsuccessful individual and team athletes were computed with the help of the ANOVA test. T-ratios were further computed to know the level of significance of differences among successful and unsuccessful (individual & team) athletes. A detailed computation is given in the form of tables and matrices.